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WORLD PETROLEUM

EDITED BY REGINALD W. CROWLY

VOLUME 1 NUMBER 1

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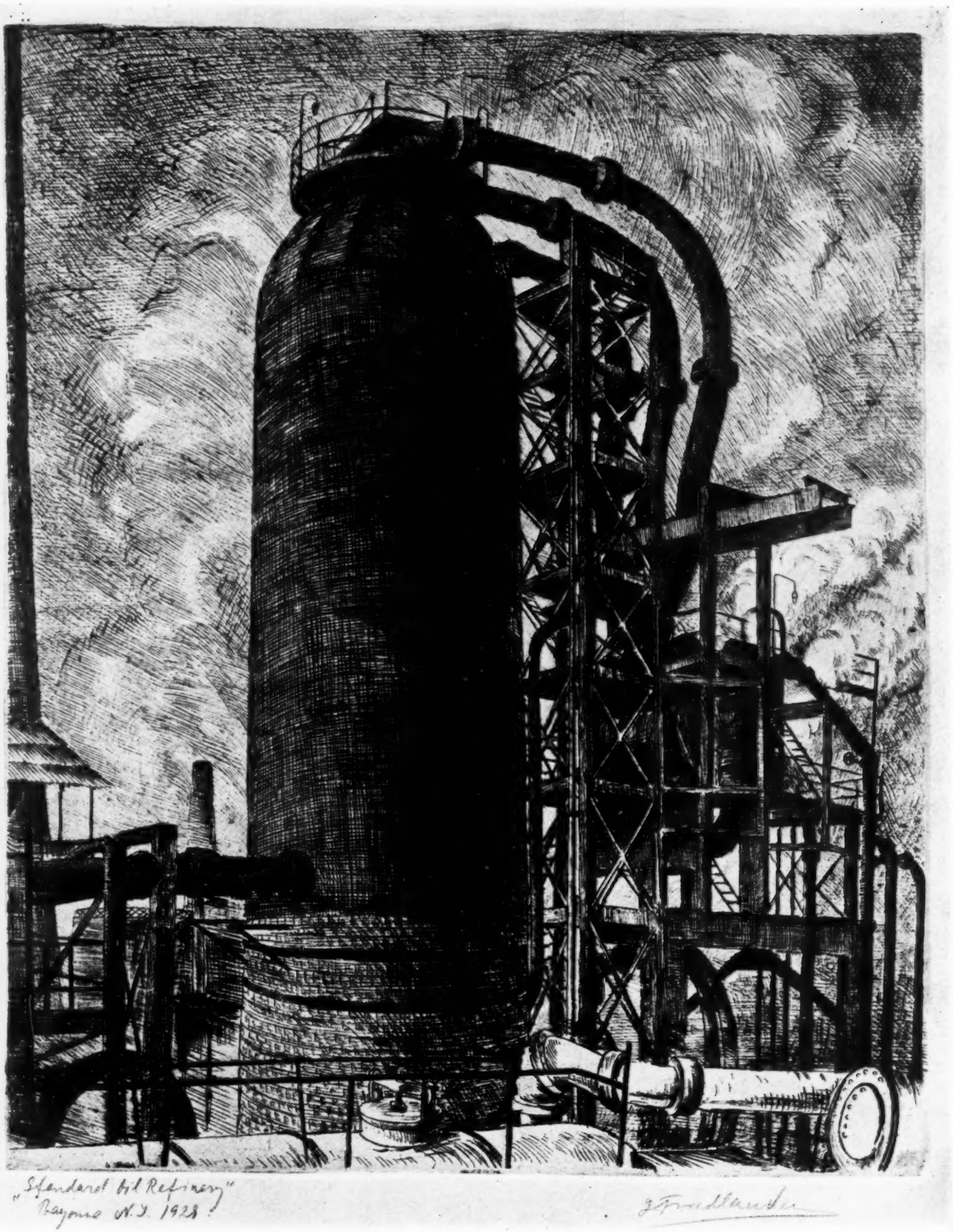

Fractionating Tower

From etching by I. Friedlander

NEW YORK · WORLD · LONDON

PETROLEUM

Foreword by the Publisher

WORLD PETROLEUM has been established to meet the need for an international publication to serve the petroleum industry of the whole globe. It will deal only with matters of international importance affecting production, refining, transportation and marketing. The aim of the publisher will be to make this journal informative, interesting and authoritative. The key statistics covering world production and movements will be presented graphically. Correspondents at strategic points throughout the world will collect facts bearing on the industry, while its trends and problems will be dealt with in special articles by men of international standing. . . . It will be the function of World Petroleum to promote the ready interchange of all information, domestic and foreign, having a practical application to the special problems of fields outside the United States. The policies of World Petroleum will be independent, progressive, constructive and non-sectional. This journal will be dedicated to fostering the advancement of the industry along sound lines—encouraging the orderly utilization of the world's petroleum resources and—promoting a spirit of harmony and mutual understanding among those engaged in the business throughout the world. . . . In this important work we solicit the cooperation of all those who have the welfare of the industry at heart.

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1929 Production

WORLD PRODUCTION statistics for 1929 are published on another page in this issue. Their presentation thus early marks a record in the publication of the annual figures. In only one previous year has a reliable compilation appeared before the latter part of February. Yet accuracy has been better served in our statistics than ever before in an annual tabulation. Here for the first time each country's total is labelled with its origin. There is no guess-work. True, most of the governments have furnished provisional figures, but they are based on sound knowledge. . . . Time will show they are accurate within ¼ per cent for all countries where the figures are compiled monthly. In less important instances the error may be greater, but not to such an extent as to introduce an error beyond ¼ per cent in the world total. Divergence may be noted between government totals and company statistics. Such differences are seldom adjustable. Contrasts have also been perceived between 1928 government returns and the 1928 estimates that are still current as a standard. In order to avoid confusion that would arise were we to use corrected 1928 figures we have taken for comparison the U. S. Bureau of Mines estimates of 1928 world production. These have been generally accepted throughout the world. . . . Our own statistics of petroleum production in 1929 set a new standard, their authenticity being plainly defined. For general convenience our figures are given in measures of metric tons and of barrels, a standard conversion ratio of 1:7 being employed.

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FOR THE BENEFIT and guidance of the world wide oil industry we initiate also the monthly statistics of petroleum production in all countries. This feature will appear every month and will be characterised by official accuracy. Almost the entire tabulation for December, given in this issue, is based on official returns. The exceptions will be noted. There has been a real need of this service, and its introduction will prove valuable to all.

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Cooperation Unattained

ENTERING THE YEAR 1930 the oil industry, as an aggregation, is faced with a greater problem of stabilization than it contemplated at the start of 1929. Prospects were rosy then for a simple unraveling of the production tangle. The only question seemed to be how soon production would be straightened out. The world was amazed a little later to learn that the biggest producing country of all, the United States, was not to be permitted to unite in a co-operative unraveling effort. All the world forces of the petroleum industry were lined up to combat the waste and dissipation of financial and material resources when Sir Henri Deterding made his visit to the United States last spring, and, as spokesman of the British and Dutch interests, reached agreement with the American interests marshalled under the presidency of R. C. Holmes. . . . The Federal authorities in Washington got cold feet when besought for their consent to this union of international business in the commendable cause of oil conservation, notwithstanding they had been the first to raise the issue. The American Petroleum Institute staggered under the surprise blow, but recovered its poise and set out along the tedious lines indicated by Washington. Its new efforts have accomplished a great deal at home. Domestic overproduction has been curtailed. . . . Yet the world problem remains. It must be tackled. The way must be found to solve it, official opposition notwithstanding.

Europe Invites

"IT WOULD PROMOTE general good fellowship and understanding and be of great help in introducing U. S. drilling supplies into foreign countries if we had adequate representation at the next Congress," writes a highly placed American in Europe, referring to the last International Drilling Congress in Europe. Another correspondent in close touch with European business writes: "I have not, amongst the many delegates and others attending either the First International Drilling Congress held in Bucharest four years ago, or at the recent 2nd Congress held in Paris, met any who would like to keep it solely European in character. On the contrary, they all want America to be closely associated. As proof of this I would mention that when attending one of the committee meetings of the Congress in Bucharest four years ago, it was even suggested that the next Congress should be held in America. You will, however, appreciate that the expense and time involved for a large body of Europeans making such a visit render such a suggestion almost inoperative, and in any case probably not representative of Europe. You no doubt fully appreciate that Roumania is the only European country which can lay claim to being really progressive in oil production, and even there it is only a few companies who avail themselves of up-to-date drilling methods. There are still in operation in Roumania many of the old European water flush systems of drilling, although the few mentioned above are employing the latest and heaviest rotary methods which they are in position to procure."

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"JUST AS A MAN comes into his strength and power only after he learns to coordinate eyes, ears, legs, arms and brain into a unified force, so it is in industry, especially in oil, which has grown so fast that it has not paused long enough to get the true perspective in order to coordinate its various branches. . . . The greatest need of the petroleum business in the future is to round out and make more complete and effective the constructive programs of 1929, not only in this country, but internationally." FRANK PHILLIPS.

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Venezuela To Expand

FREQUENT REPETITION of reports that the Venezuelan operators have an agreement covering production may, if continued, prove true at some future date. In this present year as in the past year and years before, the reports are baseless. They arise possibly from the pooling of the physical resources of the companies in emergencies, a practice general enough in the oil fields of the United States. A general understanding also governs the offset wells. In no sense, however, is production regulated by agreement. The absurdity of such reports is evidenced by the production figures of the various companies. . . . Equally far from the truth is the statement that Venezuelan production is checked. This assertion is based upon the supposition that the limit of marine transportation capacity has been reached. At the present time the gas buoys for the lighting of the channel between Lake Maracaibo and the Gulf of Maracaibo are ready to be placed in position . . . . Night navigation will probably increase the present annual transportation capacity of the fleet by 15 per cent. It will permit also the addition of new tonnage to the fleet. Venezuelan output must be expected to continue its growth.

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BELIEVE what you will about the political. theory behind the Soviet republic and about the manner in which it is being applied, the fact remains that the huge scale on which its petroleum operations are being conducted and their inevitable influence on the industry elsewhere constitute a factor about which every important petroleum producer in the world should be well informed.

Inter-Company Efforts

ANNOUNCEMENT that a refinery is to be built in France for the account of a French company jointly owned by the Standard Oil Co. of New Jersey, Atlantic Refining Co. and Gulf Oil Co. draws attention to the freedom possessed by American companies to merge in foreign trade. What the Sherman anti-trust law forbids in domestic United States operations is expressly legalized by the Webb Act in regard to export business. It was under the terms of the Webb law that the American oil exporters created their export association last year. The corporate partnership projected between the three American companies for refining operations in France is totally outside American jurisdiction, being in a foreign country. The company will be formed under French law and will operate in French territory—probably too there will be French partners. American oil companies do not have to focus their attention exclusively on the Webb Act in contemplating foreign operations.

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Inter-Company Results

THOUGH this instance of inter-company cooperation is the first recorded by American oil companies, earlier instances have been furnished by British oil companies. In the whole of British India an inter-company partnership between the Royal Dutch-Shell interests and the Burmah Oil Co. prevails, with a side contract to keep the Anglo Persian Oil Co. appeased. In the markets of East Africa and of South Africa the Royal Dutch-Shell distribution is merged with that of the Anglo-Persian firm on a 50-50 basis. Both in India and in Africa the British local partnerships still have to meet competition from companies of other nationalities, chiefly American. As between themselves, however, they have eliminated duplicate staffs, equipment and stocks. This is a new tendency. It seems to work out well when the partners are of the same nation. In the only international venture that has been attempted, namely, the Iraq Petroleum Co., the way of business has not been so smooth. In that case the partners were not drawn together by desire for collaboration, but were forced upon each other by political influences. If the political element could be eliminated, the Iraq Petroleum Co. would serve to afford a demonstration of how much, or how little, the varied business ideas of different nationalities can be harmonized in a mutual undertaking for profit.

▼

Political Business

WHAT need is there today for the British Government to retain its holding in the Anglo-Persian Oil Co., Ltd.? Whether the investment was wise originally or whether it was just panicky has no importance now. It is very profitable, but that is no vital matter to the wealthy British nation. The sound common sense of the British people should perceive that the participation of its government in the oil business can but be a cause of irritation to some countries and of inflammation to other countries. Nothing is gained and much is lost by that governmental associateship. . . . The Anglo-Persian's commercial position is so soundly established as to be impregnable. The company is financially powerful and its management admirable, yet in many countries its governmental character causes fear. Some nations have excluded it on account of its official entanglements. It stands throughout the world for the embodiment of imperialism in petroleum. . . . Morally and ethically the position of the British Government in the business is unassailable. Commercially its support has given Britain a dominant national oil company. Politically it is a blunder—a blunder of world politics. With the British Government out of the oil business, much of the provocation to other governments to intervene in the petroleum industry would be removed.

An Association of Cooperation

Sir Henri Deterding looks to Orderly Correlation of all Branches of the Activities of the Petroleum Business throughout the World

By Reginald W. Crowly

FORTY words sufficed to the head of the Royal Dutch-Shell companies to express his formula for the establishment of the world petroleum industry on a sound business basis. His brevity is mute testimony to the profound and searching thought which must have preceded.

In positiveness and directness the formula lacks nothing, written, as it is, in terms of action, conservation, cooperation and service to the public. Yet it has been received with almost the mystified wonder accorded to the thesis of an Einstein.

Sir Henri Deterding presented it as the summation of his address on Common Sense in the Oil Industry, at the meeting of the American Petroleum Institute in Chicago. To it, all his other remarks were a prelude in the course of which he twice went over the grounds of the formula: once, in a general, discursive way and, the second time, in six points. That Deterding attached the highest importance to the formula is thus revealed by the very words of the address itself.

Though the words were spoken in Chicago, they were directed to all the oil world, the address being released simultaneously in Europe and in the United States. At one and the same time the speaker was American producer, refiner and distributor, Mexican operator, Venezuelan developer and oil man of all countries (for the land is not known where the Shell symbol is not seen).

The very breadth of Deterding's view narrowed its understanding by oil men at large. Too many individuals have got only that part of it bearing upon their own immediate interests and have given no thought to the concatenation of influences tying them in with the rest of the world. The royalty holder in Oklahoma reads one meaning; the British stockholder in London reads another; the California operator praying for a Utopian gasoline export market gets one reaction; the established distributor in another country with a business shot by dumped shiploads of oil products gets another reaction. Producers in North America, South America, Europe and Asia, all forcing production—or being forced to it,—all suffering from the overproduction, have viewed Deterding's words from different angles. Deterding, with his interests everywhere, sees from all angles.

He calls for action. "Let us create," he advises in the first three words of his formula. Action truly is the first essential. But where to start? On that point Deterding has chosen to remain silent. He defines the constitution of the welfare body: it must be an "association of cooperation," and he outlines its foundation as a "basis of possibility of permanent production." The membership shall consist of "such distributing organizations as are willing to cooperate," and for the rest "do not let us worry about those who will not do so."

That Deterding purposely refrained from indicating where the start should be made seems a safe deduction. To others should go the honor of leadership. He stands aside for the reason given in the last of his six points, "we must sink vanity and aim at continually sound business rather than at temporarily being a big oil man. . . ." It is characteristic of the man, self-effacing and retiring by nature, businesslike by habit and training, somewhat altruistic by inclination. He will cooperate 100 per cent and leaves the mode of application of his formula to others in the industry.

IN SHORT my advice (in which in practice I am 100 per cent partisan and cooperator) is: "Let us create 'an association of cooperation' on the basis of possibility of permanent production, with the assistance of such distributing organizations as are willing to cooperate, and do not let us worry about those who will not do so."—*Sir Henri Deterding*

To appreciate the importance of his pronouncements one must keep in mind that about 25 per cent of the oil business outside the United States is under his direct control. British cooperation can raise his vote to more than 40 per cent. World cooperation is what he seeks. It is unattainable without cooperation of the strongest forces in the American industry, even if the rest of the world were a unit.

Conflicting forces in the oil world must be reconciled, and public opinions must be prepared before a code of order can be drawn up and put into effect. Deterding foresees that. He covers it in the six points in which he indicates the major influences demanding consideration in a world program. Cautiously, even guardedly, expressed they are found on examination to embrace:—

(1) wisdom of conservation,
(2) service to the public,
(3) penalty of overproduction,
(4) protection against dumping,
(5) wasteful competition, and
(6) conflicts of egocentricity.

Two points of public interest are given the front rank. Three points of business interest are next in line. The sacrifice of personal ambition to the good of the public and of the industry is the appeal of the sixth point. That is sense, and should be the common sense of the oil industry, without regard to national boundaries, company rivalries or selfish personalities.

World Oil Production 1929: Official

		Year 1929		Year 1928*	
TOTAL PRODUCTION.... World Petroleum		1,478,400,650 bbl.	211,200,096 tons m.	1,322,370,000 bbl.	188,910,000 tons m.
United States..... A. P. I.		1,006,681,000 bbl.	143,811,571 tons m.	901,474,000 bbl.	128,782,000 tons m.
All other countries..... World Petroleum		471,719,650 bbl.	67,388,521 tons m.	420,896,000 bbl.	60,128,000 tons m.
Venezuela	official	138,914,552 bbl.	19,844,936 tons m.	106,000,000 bbl.	15,142,857 tons m.
Russia	official	98,148,890 bbl.	14,021,270 tons m.	87,800,000 bbl.	12,542,857 tons m.
Mexico	official	44,687,879 bbl.	6,383,983 tons m.	50,150,000 bbl.	7,164,286 tons m.
Persia	private	42,500,000 bbl.	6,071,429 tons m.	42,080,000 bbl.	6,011,429 tons m.
Dutch East Indies	private	36,100,000 bbl.	5,157,143 tons m.	28,500,000 bbl.	4,071,429 tons m.
Roumania	private	32,500,000 bbl.	4,642,857 tons m.	30,600,000 bbl.	4,371,428 tons m.
Colombia	private[1]	20,384,548 bbl.	2,912,078 tons m.	19,900,000 bbl.	2,842,857 tons m.
Peru	official	12,460,000 bbl.	1,780,000 tons m.	11,970,000 bbl.	1,710,000 tons m.
Argentina	private	9,800,000 bbl.	1,400,000 tons m.	9,100,000 bbl.	1,300,000 tons m.
Trinidad	official	8,710,052 bbl.	1,244,293 tons m.	7,750,000 bbl.	1,107,143 tons m.
India—British	official	8,286,000 bbl.	1,183,714 tons m.	8,300,000 bbl.	1,185,714 tons m.
Sarawak	official[2]	5,234,873 bbl.	747,839 tons m.†	5,290,000 bbl.	755,714 tons m.
Poland	official	4,731,104 bbl.	675,872 tons m.	5,530,000 bbl.	790,000 tons m.
Japan and Taiwan	private	2,100,000 bbl.	300,000 tons m.	1,800,000 bbl.	257,143 tons m.
Egypt	official	1,868,314 bbl.	266,902 tons m.†	1,840,000 bbl.	262,857 tons m.
Sakhalin (Russian)	private	1,175,000 bbl.	167,857 tons m.	509,000 bbl.	72,714 tons m.
Canada	official	1,132,800 bbl.	161,828 tons m.	618,000 bbl.	88,286 tons m.
Ecuador	official	997,638 bbl.	142,520 tons m.	1,090,000 bbl.	155,714 tons m.
Germany	official	728,000 bbl.	104,000 tons m.	683,000 bbl.	97,572 tons m.
Iraq	official	532,000 bbl.	76,000 tons m.	650,000 bbl.	92,857 tons m.
France	official	497,000 bbl.	71,000 tons m.	520,000 bbl.	74,286 tons m.
Czecho-Slovakia	private	161,000 bbl.	23,000 tons m.	150,000 bbl.	21,428 tons m.
Others	private	70,000 bbl.	10,000 tons m.	66,000 bbl.	9,429 tons m.

* U. S. Bureau of Mines: estimate for 1928. [1] International Petroleum Co. [2] Supplied by Anglo-Saxon Petroleum Co. for Sarawak Government. † Converted from official returns in English tons.

GOVERNMENT RETURNS cabled from the principal countries indicate that crude oil production last year advanced 155 million barrels, or about 22 million metric tons, beyond 1928 production. The United States on the one hand and all the other countries of the world collectively on the other hand contributed proportionally about the same to the year's expansion. The relative magnitude of the changes in the different countries between 1929 and 1928 is seen at a glance in the colored chart accompanying this issue.

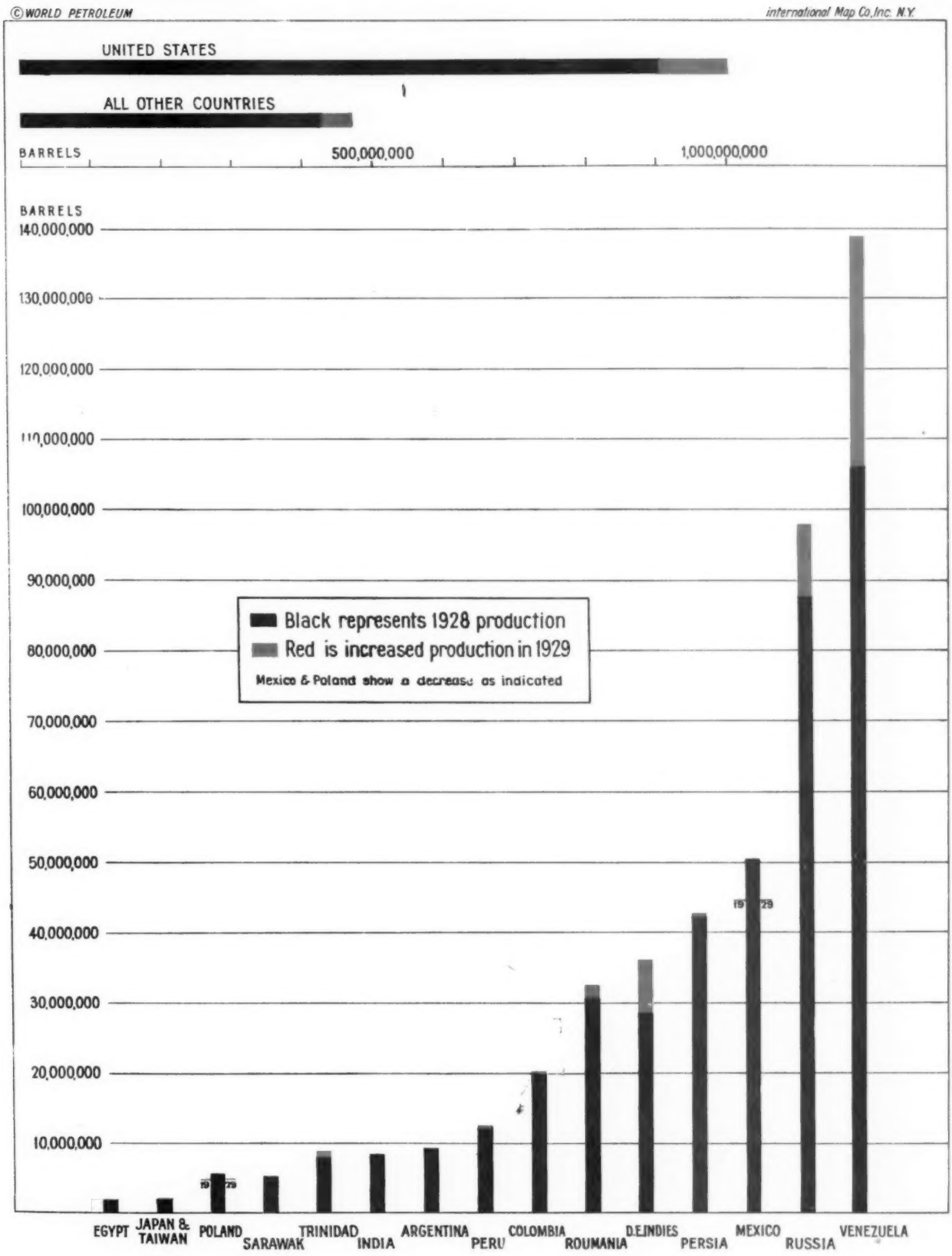
Venezuela led the increases with about 31½ million barrels, about 4½ million metric tons, compared with the 1928 official production of 107,236,094 bbl. or 15,319,442 metric tons. Russia's increase was about 15 million barrels or over 2,100,000 metric tons, based on the revised Russian total for 1928, namely 11,905,918 metric tons. In the Netherlands East Indies the increase is estimated at about 6 million barrels, equal to about 855,000 metric tons, this too being based on corrected 1928 production which was 4,307,783 metric tons or 30,154,481 bbl.

Due to the need for preserving the correct ratio between barrels and metric tons, the figures in the tables cannot throughout be expressed in round numbers.

December 1929: Official

TOTAL PRODUCTION.... World Petroleum		123,160,140 bbl.	17,594,304 tons m.
United States..... A. P. I.		81,417,000 bbl.	11,631,000 tons m.
All other countries..... World Petroleum		41,743,140 bbl.	5,963,304 tons m.
Venezuela	official	12,595,730 bbl.	1,799,390 tons m.
Russia	official	9,017,988 bbl.	1,288,284 tons m.
Mexico	official	3,925,633 bbl.	560,805 tons m.
Persia	private	3,540,000 bbl.	505,714 tons m.
Neth. East Indies	private	3,008,000 bbl.	429,714 tons m.
Roumania	official	2,940,000 bbl.	420,000 tons m.
Colombia	official	1,612,186 bbl.	230,312 tons m.
Peru	official	1,248,009 bbl.	178,287 tons m.
Argentina	private	800,000 bbl.	114,286 tons m.
Trinidad	official	770,415 bbl.	110,059 tons m.
India—British	official	610,000 bbl.	87,143 tons m.
Sarawak	official	479,675 bbl.	68,525 tons m.
Poland	official	385,700 bbl.	55,100 tons m.
Japan and Taiwan	private	175,000 bbl.	25,000 tons m.
Egypt	official	154,000 bbl.	22,000 tons m.
Ecuador	official	110,258 bbl.	15,751 tons m.
Sakhalin (Russian)	private	103,700 bbl.	14,814 tons m.
Canada	private	101,846 bbl.	14,549 tons m.
Others*	private	165,000 bbl.	23,571 tons m.

* Germany, Iraq, France, Czecho-Slovakia, Italy, etc.



World's Crude Oil Production 1929

Supplement to World Petroleum

FINANCE

London · January

Many London operators have come to the conclusion that the oil share market is one of the sections of the Stock Exchange presenting possibilities of improvement during 1930. This view is based largely on the decrease reported in United States production of crude, the evident desire of responsible leaders of the world industry for conservation arrangements, and the fact that many of the best shares stand at price levels giving a good investment return on the basis of last dividends. Optimism has not yet brought in sufficient buying to raise prices substantially, but it has served to check the decline. A number of shares, notably those of the Royal Dutch-Shell group, are appreciably above the low levels recently touched. Anglo-American Oils have responded to a persistent American demand following the offer to exchange shareholdings into shares of Standard Oil Export Corporation.

THE sensation of the past month was the halving of the price of Attock Oil shares. This company is living up to its reputation for quick changes. Its shares entered the dividend list with a payment of 6 per cent for 1923, followed by 10 per cent for 1924. Declining production from its shallow wells left shareholders dividendless for the three following years, but a fresh start with distributions was made for 1928 with 7½ per cent, and at the last annual meeting the directors expressed the hope of an interim payment for 1929. The shares changed hands at one time last year at 3⅜, but a fresh fall in production from 51,305 barrels in August to 26,110 barrels in November gave the market wind some weeks ago of unfavourable developments. Just before the end of December the directors stated that several of the largest wells were producing less, and that sufficient new wells had not been brought in to offset the decline. Further wells have been drilled into the 3600 feet to 3800 feet zone, and are being deepened, as results to date indicate that the main source of oil is still untapped. Profits for 1929 are stated to be satisfactory, but in view of the heavy development expenditure in sight, it is considered necessary to conserve resources by withholding the interim dividend. This is a well-managed concern, and its chequered career is regarded as an outstanding example of the chances and changes of oil production.

MEXICAN EAGLE'S interim statement for 1929 created a good impression. It showed an estimated production for the year of 11,965,000 barrels, or nearly double that for 1928, and a rise of 1,090,000 barrels to 14,550,000 barrels in shipments. The amount of oil purchased was rather less at 7,230,000 barrels. This figure, with the company's production, makes a total supply for the twelve months exceeding shipments by 4,645,000 barrels, indicating that this amount was added to oil in storage. Negotiations have been practically completed for the acquisition by the company of the whole share capital of the Compania Mexicana Holandesa La Corona, another subsidiary of the Royal Dutch-Shell group, the consideration being 2,000,000 Mexican Eagle shares. A close working arrangement already exists between the two companies. The report states that the new Mexican Petroleum Law has served to clarify the situation in so far as operations of petroleum companies are concerned, but the directors view with apprehension the recent trend of Mexican legislation such as the new Labour Law. They believe that steps in this direction will tend to restrict exploration work and the investment of new capital in the country. The company is nevertheless going ahead with its prospecting and development plans, with moderate general success. It is also spending money on extensions and improvements to refineries, from which substantial working economies are anticipated.

The company had previously announced its intention of exercising its right to purchase the whole of the 400,000 £5 preference shares of the Eagle Oil Transport Company at £6 per share. This option matures in July next and was assigned to the Canadian Eagle Oil Company when the latter came into existence in 1928 as a result of the segregation of Mexican Eagle assets, among which were 600,000 Eagle Oil Transport £5 ordinary shares. The Canadian Eagle will therefore take over the Transport preference shares involved in the option.

This operation, with the proposed absorption of the La Corona company by the Mexican Eagle, appears to mark a fresh step in the consolidation of the interests of the Royal Dutch-Shell group.

AN early reduction in the capital of British Controlled Oilfields is foreshadowed in the annual report just issued for the year to July 31, 1929. Declining production in Venezuela was offset by increased output from the Trinidad subsidiary, and a gross profit of £440,171 was earned, against £405,280 for 1927-28. Improved results are attributed to better production methods and the rise in the British price for petrol last year. Undivided surplus now amounts to £1,244,675. The fly in the

London Stock Exchange Prices

1929 High	1929 Low	1929 Div.	Share	Dec. 3-Jan. 6 First	High	Low	Last	Change
3 31/64	2 3/4	7½*	Anglo-American	3 3/8	3 15/32	3 5/16	3 7/16	+ 1/16
1 5/16	13/16	3½	Anglo-Ecuadorian	7/8	7/8	13/16	27/32	— 1/32
3 5/16	2 7/32	22½	Anglo-Egyptian "B"	2 9/32	2 3/8	2 5/32	2 9/32	....
4 15/16	3 11/16	12½	Anglo-Persian	3 13/16	3 7/8	3 5/8	3 11/16	— 1/8
1 31/32	1 5/32	52½	Apex Trinidad (5s.)	1 5/16	1 11/32	1 1/4	1 1/4	— 1/16
3 3/8	1	7½	Attock	2 1/4	2 1/4	1	1 1/4	—1 1/4
3/4	15/32	12½	Brit. Borneo (10s.)	1/2	17/32	15/32	15/32	— 1/32
3/4	5/16	7¾*	Brit. Burmah (8s.)	11/32	11/32	5/16	5/16	— 1/32
3/8	3/16	....	Brit. Controlled ($5)	7/32	7/32	3/16	7/32	....
15/16	9/32	....	Brit. Controlled, Pfd. ($5)	5/16	11/32	5/16	11/32	+ 1/32
4 27/32	3 3/4	20	Burmah	3 7/8	3 15/16	3 23/32	3 3/4	— 1/8
11/16	15/32	....	Canadian Eagle	17/32	19/32	17/32	19/32	+ 1/16
7/16	9/32	....	Kern River (10s)	5/16	5/16	5/16	5/16	....
2 5/8	1 13/16	10	Lobitos	1 7/8	1 31/32	1 13/16	1 13/16	+ 1/16
29/32	17/32	....	Mexican Eagle ($4 Mex.)	17/32	19/32	17/32	3/4	+ 1/32
70 1/2	41 3/4	....	Pan-American "B" ($50)	62	62	59 1/2	60	—2
13/16	13/32	2½	Phoenix	13/32	1/2	7/16	7/16	— 1/32
38 3/8	31	24	Royal Dutch (100 fl.)	33 1/8	33 3/4	32	33 1/2	+ 3/4
5 19/64	4 7/8	25*	Shell Transport	4 11/16	4 27/32	4 1/2	4 27/32	+ 9/32
21/32	7/16	4	Steaua Romana	15/32	1/2	7/16	7/16	— 1/32
4 3/4	3 25/32	30	Trinidad Lease	4 1/32	4 1/16	3 31/32	3 31/32	— 1/32
17/32	5/16	....	Utd. Brit. Trin. (6s. 8d)	11/32	11/32	5/16	11/32	....
4 9/16	2 5/8	22½	V.O.C. Holding	2 7/8	2 29/32	2 13/16	2 29/32	+ 1/32

*Denotes tax free dividend.
Nominal value of shares £1 unless otherwise indicated by bracketed figures.

ointment is provided by further losses on concessions, which have been included in the concessions suspense account, now standing in the balance sheet as an intangible asset exceeding £5,000,000. This company has been in existence 12 years without paying a dividend on its capital—equivalent to £9,000,000—and reconstruction is now considered necessary to cut capital to a figure likely to render payment of dividends probable. A reduction of as much as 75 per cent in the ordinary shares may be necessary to accomplish this.

APEX (Trinidad) Oilfields completed another highly successful year at the end of September last. The report issued early in January shows that production and deliveries both increased by about 40 per cent on corresponding figures for 1927-28, Profits rose from £246,429 to £313,208, and the total dividend was increased from 35 per cent to 52¼ per cent. The company was formed ten years ago, and has since paid £1,284,000 in dividends, including that for the past year, on a capital which is even now only £500,000 and was smaller until 1927.

THE ANNUAL meeting of Steaua Romana (British) in December brought a statement from the chairman on a new agreement between producers and refiners in Roumania. The previously existing agreement was dissolved at the end of 1928, and the local market became completely demoralized. After long negotiations a new arrangement was made in November, from which better prices are anticipated in Roumania's natural markets for petroleum products.

A. H. DAY

New York · January

STANDARD OIL COMPANY (Indiana) has reported control of over 80 per cent of the 3,442,608 shares of common and Class B of Pan American Petroleum & Transport, including stock formerly held through ownership of Pan American Eastern Petroleum and other shares received under the exchange offer of seven shares of Indiana for each six of Pan American. One block of 49,296 shares of Pan American Class B was deposited for exchange by the English company Tankers, Ltd., which stated this was its only investment holding. Pan American owns approximately 95 per cent of the stock of Lago Oil & Transport, which is one of the major producers in Venezuela. A refinery has been built on the Island of Aruba, Dutch West Indies, to handle all of Lago's production and to supply gasoline and other refined products for the enlarged distributing organization Pan American has been building up in the territory along the Atlantic Coast. The flexibility of the refinery will result in a material decrease in Pan American's participation in the fuel oil business, in which she has been so largely and so unprofitably engaged in the past. A material improvement in earning power is indicated, and some predictions have been made that net of $7 to $8 a share could be expected in the next year or two. Standard (Indiana) is one of the more important listings on the New York Curb Exchange and application for listing on the New York Stock Exchange has been anticipated for some time. This appears all the more probable now, inasmuch as Pan American has long enjoyed big board listing.

STANDARD OIL COMPANY (New Jersey) is acquiring control of Anglo-American Oil Co., Ltd., which was the marketing subsidiary in England of the old Standard Oil Company prior to the dissolution decree issued against that company in 1911 under the Sherman Anti-Trust Law. Standard Oil Export Corporation, which was formed to coordinate and strengthen the various export activities of the New Jersey Company and which is controlled jointly by four of its strongest domestic subsidiaries, has offered to exchange one share of guaranteed 5 per cent non-voting preferred for each 5⅝ shares of Anglo-American voting and non-voting stock. Anglo-American has continued to confine its activities to the distributing branch and has been increasingly in a less favored position as the trend in the industry has progressed toward more complete integration of operations. The offer expires January 31. It is reported that success of the plan is assured inasmuch as more than 66 per cent of the Anglo-American stock has been deposited.

STANDARD (New Jersey) has initiated a new price basis for determination of retail gasoline prices throughout its Atlantic Seaboard territory. The former method was to average costs delivered at all points in a given state and establish a uniform price. The new system will have as its base the cargo market (tank steamer lots) at seaboard points, and the prices at individual points will bear the actual freight charges thereto. This policy favors those centers near the water terminals and will act as something of a deterrent to the dumping in the eastern section of excess gasoline production from the West Coast. This will in turn have some constructive influence on the stabilization of the industry in this country, inasmuch as California has been the worst offender during the past year in overproducing in relation to its normal markets. It is estimated that the net change in gasoline prices by Standard represents a downward revision of something less than 1 cent a gallon, which need not be construed as unfavorable to the company's earning outlook since the trend of gasoline prices is normally downward at this season. Other marketers in the territory are revising their prices to a corresponding basis.

New York Stock Exchange Prices

1929 High	1929 Low	1929 Div.	Stock	Dec. 15—Jan. 15 Sales	First	High	Low	Last	Chgs.
47¼	34½	2.00	Associated Oil	610	34½	36⅛	34½	36⅛	+1⅝
77⅞	30	†2.00	Atlantic Refin.	103,900	38	39⅜	36¼	36½	−1½
49⅛	20	†2.25	Barnsdall A.	132,700	23⅝	24¼	21⅝	21⅞	−1¾
32⅞	12½	....	Beacon Oil	34,200	15	16⅜	12½	14	−1
47⅛	18	....	Continental Oil	216,600	22⅜	23⅞	21⅛	22	− ⅜
11¾	5⅜	....	Creole Petrol.	97,500	6½	6⅝	6	6⅜	− ⅛
209	115	1.50	Gulf Oil	16,300	135	141	130⅛	134⅛	− 7⅛
128	74⅛	2.00	Humble Oil	14,500	82⅝	86⅜	78	79¼	−3⅜
27⅜	9	0.50	Imperial Oil	16,700	25½	27⅜	25⅛	25½	.....
38⅜	16½	....	Lago Oil & Tr.	2,500	21	21⅝	21	21½	+ ⅛
69⅜	9¼	....	Mexican Seaboard	101,500	17½	19¼	15¼	16⅜	−1⅛
69	40¼	....	Pan American P. & T.	2,600	58	60⅛	57⅛	58	.....
69¼	40½	....	Pan American B	16,700	57	60⅞	52¾	52¾	−4¼
47	24⅛	2.50	Phillips Petrol.	61,900	32⅛	36	31⅜	32	− ⅛
65⅝	40½	†2.50	Prairie Oil & Gas	30,400	52⅛	52¾	50	50¼	−1⅞
30¾	20	1.50	Pure Oil	62,000	22⅝	24⅜	22	22⅞	+ ⅛
49⅝	20	2.00	Richfield Oil	85,900	24	26½	22⅝	26	+2
64	43⅛	*3.20	Royal Dutch (N. Y.)	65,500	51⅜	54⅝	50½	53¼	+2¼
55¾	43⅛	*2.41	Shell Tr. & Tr.	160	46	47	45	45	−1
31¾	19	1.40	Shell Union Oil	36,600	22⅞	23⅞	22⅛	22⅞	.....
45	21	2.00	Sinclair Consol.	206,200	24	24⅞	23	23¾	− ⅛
46½	28	2.00	Skelly Oil	26,500	30⅛	32	29⅞	30	− ⅛
81⅞	51½	2.50	Standard Oil of Calif.	66,600	60⅞	61⅝	59¼	60	+ ⅜
63	45	2.50	Standard Oil (Md.)	134,200	52⅞	54¾	52⅛	52¼	− ⅝
83	48	†2.00	Standard Oil (N. J.)	287,500	62½	66⅞	60½	63½	+1
48⅛	31¾	1.60	Standard Oil of N. Y.	207,700	37⅞	33⅞	31¾	32¼	−5⅝
86⅜	55	§1.00	Sun Oil	4,900	56	59⅜	56	59	+3
71⅞	50	3.00	Texas Corp.	87,700	55	56⅜	53¼	53⅞	−1⅛
23½	10	0.60	Tidewater Assoc.	115,600	12½	13¼	11⅜	12½	.....
57	42⅛	*2.00	Union Oil of Calif.	16,200	43¾	46¼	43¼	44	+ ¼
133¾	75⅛	†4.25	Vacuum Oil	17,300	95	96½	93	94	−1
6½	1¾	0.20	Venezuelan Pet.	23,900	2⅜	3¼	2¼	3¼	+ ⅜

†Including extras ‡Plus 4% in stock. §Plus 9% in stock .*Paid last year—no regular rate.

CONSOLIDATED balance sheet of Phillips Petroleum as of September 30, 1929, as reported to the New York Stock Exchange, revealed net working capital of more than $19,000,000, including about $5,500,000 in cash and marketable securities. Ratio of current assets to current liabilities stood at better than 4 to 1. The net property account showed $114,500,000, an increase of about $18,700,000 over December 31, 1928. The company is continuing to enlarge and expand its operations and facilities, and increased its capitalization from 2,407,082 shares to 2,524,338 shares during the indicated period. Net of $6.23 a share was reported before depreciation and depletion charges for the first nine months of 1929. Profits, after all charges, of between $2.75 and $3.00 are not unlikely to be reported for the entire year.

▼

W. G. SKELLY, president of Skelly Oil Company, has been quoted as stating that earnings in 1929 were satisfactory, having covered annual dividend requirement of $2 a share more than two-and-one-half times. This indicates net of more than $5 a share in comparison with $3.76 reported for 1928.

▼

STANDARD Oil Company of Kansas reports profits for 1928, after all charges, equal to $4.73 per share on 320,000 shares ($25 par), a substantial increase over the 91 cents a share earned in 1928. It is largely engaged in the refining and marketing branches and has completed an extensive program of plant rehabilitation and modernization extending over several years. Results appear to be justifying the expenditures.

▼

RICHFIELD Oil is reported to have acquired 100 per cent of the voting and 93 per cent of the no-voting stock of Pan American Western, control of which was acquired from E. L. Doheny in 1928, and the latter company is said to be now in process of dissolution. Richfield has reported rapidly expanding profits in recent years, and estimates indicate net for 1929 of $9,000,000 or better, in comparison with $7,818,076 earned in 1928.

▼

TIDEWATER Associated Oil Company is resuming dividend payments on the common with two semi-annual payments of 30 cents a share each, payable February 15 and August 15, 1930. The last dividend was 15 cents a share, paid August 1, 1927. The company is reported to hold 95.4 per cent of the Tidewater Oil common and 95.5 per cent of the Associated Oil common. Exchange offers on the basis of 1¾ shares of the parent company for each share of Tidewater Oil, and 3 shares for each share of Associated Oil, remain open until February 15, 1930. It is estimated that consolidated net earnings in 1929 amounted to around $1.50 per share of Tidewater Associated common after all charges and preferred dividend requirements. Thus the new dividend rate on the common was earned more than two times over.

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CREOLE PETROLEUM Corporation reports a gain last year of over 30 per cent in the Creole share of production from other companies' operations. The average was 20,588 barrels daily in 1929 compared with 16,666 barrels daily in 1928. Earnings will be reported in two or three months. Standard Oil Co. of New Jersey, which controls Creole, is now believed to own about 60 per cent of the common stock.

▼

IT has been estimated that barring exceptional year-end charge-offs Gulf Oil Corp. of Penna. is likely to show 1929 net of close to $50,000,000, equal to about $11 a share in comparison with $8.06 earned in 1928. The company's budget for 1930 indicates expenditure of $75,000,000 in construction and expansion of facilities, a substantial proportion of which would be allocated to the Pittsburgh district.

C. C. BAILEY

▼

Paris · January

SIPER (Société Industrielle des Pétroles Roumains) has announced an operating profit of Frs. 1.648.898 for the financial year ending June 30, 1929. The whole of this has been used for write-downs. The company owns one-quarter of the issued shares of the I.R.D.P. and has always looked to dividends from the latter as one of its chief sources of revenue. The financial situation of the I.R.D.P. is precarious owing to lack of working capital and to the high bank rate in Roumania (20 to 30 per cent); its profits are therefore nil despite good oil production. If the excellent reserve concessions obtained from the Roumanian State could be opened up, I.R.D.P. might well become one of the best Roumanian companies and SIPER'S situation would immediately improve.

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For this reason SIPER'S balance sheet has attracted attention, and an American group recently paid a visit to Roumania to look into the I.R.D.P. Co.'s situation. Opinion is reported to have been favourable, and they are stated to be prepared to take a hand in helping the company out of its present difficulties. SIPER'S shares are quoted round about Frs. 50 in Paris.

Paris Bourse—Prices

		Dec. 1-Jan. 2		
Last Div.	Share	Low	High	Last
20 lei	Astra Romana	292	303	281
100 lei	Colombia	169	199	281
50 lei	Concordia	146	162	150
50 lei	Crédit Gal Pétroles act.	832	915	905
50 lei	Crédit Gal Pétroles parts	9.700	10.800	10.550
50 lei	Franco Polonaise Pétroles act.	160	197	10.550
50 lei	Franco Polonaise Pétroles parts.	675	890	775
$0.28	Franco Wyoming	510	545	505
Frs. 20	S. G. Huiles Pétrole act.	436	494	505
Frs. 20	S. G. Huiles Pétrole parts.	167	192	185
Frs. 20	Cie Française Des Pétroles	1.005	1.125	1.120
Frs. 50	Cie Industrielles Pétroles	945	975	970
Frs. 65	Lille Bonnières prior.	1.065	1.105	1.085
Frs. 40	Lille Bonnières ord.	700	740	735
.....	Malopolska act.	303	350	340
.....	Malopolska parts.	2.050	2.305	2.255
$0.398	Mexican Eagle	170	178	165
Frs. 17.50	Omnium International	237	258	241
Frs. 50	Péchelbronn	1.035	1.120	1.050
F.B. 60	Pétrofina	617	664	652
Fl. 240	Royal Dutch	40.250	41.550	40.500
Fl. 24	Royal Dutch 1/10/	4.030	4.185	4.060
5 sh.	Shell Transport	591	604	594
Frs. 30	Standard Franco Américaine	591	604	594
Frs. 25	Steaua Française	331	362	594

SHAREHOLDERS of Pétrofina have voted to increase the capital from 200 to 300 million francs by a new issue of 10.000 A shares and 190.000 B shares. They will have the right to purchase one new B share at Frs. 750 for every two shares held. "Pétrofina," otherwise known by the name of Compagnie Financière Belge des Pétroles is a Belgian company with its principal business in France. The French Government advanced it a loan of Frs. 30.000.000 in 1923 for 20 years without interest. Pétrofina controls the Société CONCORDIA and the Société SIRIUS, both Roumanian concerns. It also represents the Soviet Oil Syndicate in France and Belgium, and sells their products in both countries by exclusive contract. Latterly it has formed two subsidiary companies, namely the Société Française de Recherches au Vénézuela and the Syndicat Franco-Persan. It is to finance these two new concerns that the company decided to increase its capital. Profits for 1929 are expected to be about 50.000.000 frs.

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WE feel sure you will not wish to miss any of the articles scheduled to appear in WORLD PETROLEUM during the next few months. They will deal with subjects of great practical interest to every one connected with world commerce in petroleum. They will be written by men of authority in the industry, and will be illustrated wherever possible by clear maps and informative photographs.

In addition to these articles, every issue of WORLD PETROLEUM will contain much valuable information in the following departments: Shipping, Finance, Commerce, Laws and Taxes, Production, Library. Each month the crude oil production of the world for the preceding month will be presented from official returns collected by us in all countries.

Foreign Oil Legion

J. H. STABLER, Caracas representative of the Venezuela Gulf Oil Co., spent the month of December in New York.

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COMMANDER H. V. LEVINGTON of the British Controlled Oil Fields, Ltd., Trinidad, has gone to Ecuador in the interest of his company, which has purchased a proven field in that country.

A. N. Glazener, Acting Director of Royal Dutch Refinery at Curaçao

Chester M. Crebbs, General Manager of Venezuela Gulf Oil Company

CHESTER M. CREBBS, general manager of the Venezuela Gulf Oil Co., Maracaibo, returned to his post the middle of January after three months leave in the United States.

▼

HENRY C. LINAM has arrived at Maturin, Eastern Venezuela, to take up his new duties as superintendent of the Eastern Venezuela division of the Creole Petroleum Syndicate, in place of R. V. Whitman, who is now in Maracaibo. Mr. Whitman will probably return to Eastern Venezuela later, in another capacity, as indications point to the concentration of the company's activities in this part of the country, where they now have a proven field. The erection of a deep water terminal and of a colony near the field are Creole projects for the coming year. Mr. Linam was formerly superintendent at the Creole's Totumo Field, west of Lake Maracaibo. He has also recently had charge of drilling operations at Hombre Pintado, State of Falcon, Venezuela.

E. A. SATCHELL, general superintendent of the Lago Petroleum Company, has resumed his duties in Venezuela after three months vacation in England and a business visit to New York.

▼

COMMANDER W. DRUMMOND BAYNE, of the British Controlled, formerly in Maracaibo District, is now in Trinidad. He is at the same time directing exploration and survey activities for his company's numerous holdings in nearby Territorio Delta Amacuro, Eastern Venezuela.

▼

E. G. SEUBERT, president of the Standard Oil Co. of Indiana, accompanied by R. G. Stewart, president of the Pan-American Petroleum & Transport Co., is on a tour of inspection of the Lago properties in Venezuela and of the new refining plant on the island of Aruba.

▼

STUART M. CROCKER, elected this month to a vice-presidency of the international General Electric Company accompanied Mr. Young to Europe in 1924 as secretary of the American delegation to the Experts Conference which culminated in the Dawes plan. In 1928 Mr. Young took Mr. Crocker with him to the Reparations Conference which formulated what is known as the Young plan.

▼

Flying in Venezuela

VENEZUELA, like many other nations the world over, requires foreigners to secure permission before flying over it or landing within its boundaries. Unlike neighboring Colombia, where the famous Scadta air service has kept peak-bound Bogota in touch with the coast for the last 10 years, no public passenger airway has been developed in Venezuela. The government itself owns six military scout planes, stationed at Maracay, seat of former President Juan Vincente Gomez, Commander-in-Chief of the army. For their aid direction beacons have been set up over the country.

During the present year survey calls have been made at Maracay by the New York, Rio and Buenos Aires Lines, Inc., and by the Pan-American Airways, Inc., but the company that really "broke the ice" through the interior of Venezuela is the French air-mail service, the Compagnie Générale Aëropostale, which has had men working out routes within the country for some time. Their inauguration flight from Ciudad Bolivar on the Orinoco, business center of Southeastern Venezuela, to Caracas, is already a thing of the past, with service, for which contracts have been granted, due to begin in January and possibly to be extended to Maracaibo.

Such preliminaries on the part of other interests have paved the way for private air transportation, not only in proving the feasibility of that mode of travel in Venezuela, but particularly in establishing landing fields, routes, and fueling stations.

Early in November the Creole Petroleum Corporation, closely followed by three branches of the Shell interests, the Colon Development Company, Ltd., the Venezuelan Oil Concessions, Ltd. and the Caribbean Petroleum Corporation, obtained from the Venezuelan Government permission to operate passenger planes in the business of the companies.

The Shell interests, whose main South American operations are centered in various parts of Maracaibo Basin, are already equipped with good means of communication. The Shell plane will therefore be used mostly for emergency trips between Maracaibo and the Colon District territory southwest of Lake Maracaibo. By plane the whole trip will be shortened by about 24 hours going south and by about 12 hours going north.

The Creole expects to use its plane more diversely, because its activities are scattered right across the country, with head offices in Maracaibo (Punta de Leiva), Caracas and Maturin, and with drilling operations going on in Maracaibo Basin, in the State of Falcon, Northwestern Venezuela, and in the State of Monagas, Eastern Venezuela.

Up to the present, cross-country travel between these places has involved very difficult and, in the rainy season, impassable stretches, while going around by water requires frequent changes. The entire trip between Maracaibo and Maturin involves at least ten days of travel, plus an uncertain number for awaiting connections, generally a total of from two to three weeks. On the other hand, the plane will fly between these points in less than two days, stopping midway, at Caracas.

Numerous other oil companies in Venezuela have the same transportation problems. That they too will follow the lead of the Shell and the Creole, and like them "rise above these difficulties," is highly probable. M.D.B.

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LAWS & TAXES

Australian Commonwealth

AN increase in the Federal petrol tax is proposed with a view to increasing the federal aid given to the States for road building. Present tax is 2d. per Imperial gallon. The proposed increase is 3d. The entire proceeds of the augmented taxation would be handed back to the States in the same manner as the current revenue from the 2d. tax. The Federal Aid Roads Agreement would be abolished, leaving the administration of roads entirely to the State governments. Opposition is offered by most of the States, which are themselves desirous of imposing the taxation. In the view of the Federal Prime Minister such State action would be unconstitutional, the power to enact petrol legislation being vested in the Commonwealth.

Canada

IMPOSITION of a tax of 5 cents per Imperial gallon on gasoline is now regarded as a certainty in British Columbia. It is anticipated that the Legislature, which meets shortly after the first of the year, will enact a measure amending the present law providing a tax of 3 cents. Opposition has been manifested against a tax on gasoline, which, at present, is levied under an act providing for a tax on fuel oil, which has been found to be ultra vires of the Provincial Legislature. Uncertainty is said to exist as to whether an increase in the tax on gasoline would imperil that source of revenue by means of a similar legal attack.

Increase of the present Manitoba tax on gasoline from 3 cents to 5 cents per Imperial gallon is forecast. The increased burden on gasoline is projected to offset a reduction in land taxation. The Manitoba Government's recent cut of 50 per cent in land taxation will diminish the annual revenue approximately $1,000,000. The addition of 2 cents a gallon to the gasoline tax is estimated to yield this amount.

French Indo-China

MINERAL oils from the Netherlands East Indies will benefit from the application of the minimum tariff on importations into French Indo-China, according to an official announcement recently issued in the Journal Officiel, Paris.

Mexico

CHANGES in the national law governing taxation of petroleum production became effective on January 1 and will mean a drop of about three centavos (one and a half cents, U. S.) per barrel of light and heavy crude and fuel oil. In substance, the modifications of the taxation measure mean that the basis upon which this levy is computed, namely, the price of bunker fuel oil in New York, has been changed. Formerly a rate of $1.25 (U. S.) per barrel for this oil was the minimum accepted by the government for the assessment.

The minimum has now been lowered to $1 per barrel New York. If the New York bunker rate increases to, say, $1.50 per barrel the Mexican government will profit, but if it remains at its present figure, about $1.05, and if 1930 shipments correspond to those of last year it is estimated that the Mexican petroleum industry will profit to the extent of some 500,000 pesos (about $250,000, U. S.), during the year 1930.

Oil men in Mexico have reason to be pleased with these modifications. The benefits, in cash, from the "reduction" are not very much, but the shifting of the minimum base line represented the outcome of nearly three years of effort on the part of the oil companies operating in Mexico. These companies began efforts for the establishment of a new taxation standard in April, 1927.

South Australia

UNDER the terms of the Petrol Tax Bill, recently introduced into the South Australian Parliament, a tax of 4½d. per Imperial gallon will be imposed on petrol used in motor vehicles. The Premier of South Australia announced his intention to secure passage of this legislation in order to test its constitutionality, the Federal government disputing the right of the States to levy petrol taxes. The bill provides for the licensing of all retailers and their appointment as government agents. Oil companies will be registered as petrol merchants or importers and will be obliged to furnish returns showing their deliveries.

COMMERCE

Austria · 1929 1st Half of Year

Imports during this period were slightly ahead of the rate of imports during the previous year, except in the case of crude, which was reduced in quantity.

ORIGIN OF IMPORTS: *Abstract*

Crude	—Roumania	112,119 bbl.	100%
Gasoline	—Roumania	310,505 bbl.	87%
Kerosene	—Roumania	85,041 bbl.	71%
	Russia	18,910 bbl.	16%
Gas Oil	—Poland	77,930 bbl.	73%
	Roumania	21,685 bbl.	20%
Lub. Oils	—United States	14,518 bbl.	45%
	Poland	4,095 bbl.	13%
	Roumania	3,836 bbl.	12%
Wax	—Poland	1,342,601 lb.	51%
	Roumania	553,355 lb.	21%
	United States	434,306 lb.	16%

China · 1928

Nearly 7 million barrels of kerosene and over 40,000 tons of paraffin wax were entered through the Chinese Customs Service in 1928. The value of imports from the United States was considerably greater than from any other single country. The share of the Netherlands East Indies would probably loom larger if the origin of the imports from Hong-Kong and Singapore were declared.

ORIGIN OF IMPORTS: *Abstract*

Gasoline	—United States	205,592 bbl.	43%
	Neth. E. Indies	159,229 bbl.	33%
Kerosene	—United States	4,849,729 bbl.	77%
	Hong-Kong*	817,094 bbl.	13%
	Neth. E. Indies	394,582 bbl.	6%
Fuel Oil	—United States	907,024 bbl.	53%
	Singapore*	399,280 bbl.	23%
	Neth. E. Indies	207,758 bbl.	12%
	Hong-Kong*	162,114 bbl.	9%
Lub. Oils	—United States	233,470 bbl.	77%
Wax	—Neth. E. Indies	30,614,744 lb.	33%
	United States	30,466,515 lb.	33%
	Hong-Kong*	18,915,670 lb.	20%

*Port of transhipment; country of origin undeclared.

Chosen (Korea) 1929 · 1st Half of Yr.

This market is notable for the competition of Japanese products against the imports from the Netherlands East Indies and United States.

ORIGIN OF IMPORTS: *Abstract*

Crude	—Neth. E. Indies	22,433 bbl.	29%
Gasoline	—Neth. E. Indies	39,230 bbl.	45%
	Japan	18,682 bbl.	21%
	United States	14,759 bbl.	17%
Kerosene	—United States	133,000 bbl.	70%
	Neth. E. Indies	43,306 bbl.	23%
Fuel Oil	—Japan	19,936 bbl.	52%
	United States	8,707 bbl.	23%
Lub. Oils	—Japan	26,481 bbl.	86%
Wax	—United States	374,625 lb.	73%

Ecuador · 1928

Only during the last month were the Ecuador exports for 1928 officially published. The production is derived by a British company.

DESTINATION OF EXPORTS: *Abstract*

Crude	—United States	766,274 bbl.	89%
	Canada	61,694 bbl.	7%
	Peru	32,587 bbl.	4%

During the same period Ecuador imported from the United States 124,681 bbl. classified as crude, but which was possibly fuel oil. Wax imported from the U. S. amounted to 1,300 tons.

Egypt · 1928

Imports of kerosene, fuel oil and gasoline into Egypt are considerable. Only part of the demand is supplied by the Suez refinery, operating with Egyptian crude.

ORIGIN OF IMPORTS: *Abstract*

Gasoline	—Suez (refinery)	231,090 bbl.	42%
	Roumania	180,070 bbl.	35%
Kerosene	—Roumania	1,132,726 bbl.	50%
	Russia	984,963 bbl.	44%
	United States	119,919 bbl.	5%
Fuel Oil	—Suez (refinery)	399,120 bbl.	44%
	Persia	177,109 bbl.	19%
Lub. Oils	—United States	102,291 bbl.	73%

DESTINATION OF EXPORTS: *Abstract*

Gasoline	—France	177,497 bbl.	80%
Fuel Oil	—Not specified	433,906 bbl.	100%

Peru · 1928 and 1st Half 1929

South American and Central American countries take a large part of the Peruvian exports of refined products.

DESTINATION OF EXPORTS: *Abstract*

Crude	—Argentine	1,910,006 bbl.	35%
	Canada	1,760,815 bbl.	32%
	United States	1,144,444 bbl.	21%
Gasoline	—Argentine	863,702 bbl.	33%
	Germany	582,327 bbl.	22%
	Brazil	461,185 bbl.	18%
	Chile	267,206 bbl.	10%
	Netherlands	195,262 bbl.	8%
Fuel Oil	—Chile	540,819 bbl.	48%
	Canada	394,532 bbl.	35%

On the import side Peru received, during the same period of 18 months, about 20,000 bbl. of lubricating oils, 450 tons of greases, and nearly 2,000 tons of paraffin wax from the United States, in addition to nearly 1,000 tons from Great Britain.

Poland · 1929 1st Half of Year

A notable decline of exports of paraffin wax and of greases is observed in the latest semi-annual statistics. Against 34,000 tons of the former and over 24,000 tons of the latter exported in 1928, the first six months of last year showed about 11,000 tons and about 8,800 tons respectively.

DESTINATION OF EXPORTS: *Abstract*

Gasoline	—Czecho-Slovakia	83,037 bbl.	54%
	Danzig*	33,669 bbl.	22%
Kerosene	—Danzig*	80,577 bbl.	42%
	Czecho-Slovakia	41,292 bbl.	22%
Lub. Oils	—Danzig*	53,781 bbl.	36%
	Austria	28,812 bbl.	19%
	Czecho-Slovakia	27,671 bbl.	18%
Gas Oil	—Austria	68,585 bbl.	36%
	Switzerland	46,813 bbl.	24%
	Danzig*	24,433 bbl.	13%
Wax	—Danzig*	11,426,442 lb.	42%
	Germany	3,364,220 lb.	14%
Greases	—Germany	10,198,480 lb.	52%
	Austria	2,976,210 lb.	15%
	Danzig*	1,906,979 lb.	10%

*Port of shipment; destination not specified.

Roumania · 1928

About 18 million barrels was the quota of Roumanian exports of refined products and residual oil during the year 1928, according to the official figures just published.

DESTINATION OF EXPORTS: *Abstract*

Gasoline	—Germany	1,213,239 bbl.	22%
	Austria	903,406 bbl.	16%
	Great Britain	763,946 bbl.	14%
	Hungary	520,948 bbl.	9%
	France	462,349 bbl.	8%
	Italy	342,151 bbl.	6%
	Czecho-Slovakia	321,020 bbl.	6%
	Greece	284,606 bbl.	5%
	Egypt	244,817 bbl.	4%
Kerosene	—Egypt	1,123,587 bbl.	21%
	Italy	841,774 bbl.	16%
	Great Britain	646,180 bbl.	12%
	Hungary	602,361 bbl.	11%
	Austria	337,482 bbl.	6%
	Germany	306,621 bbl.	6%
	Yugoslavia	298,569 bbl.	6%
	Belgium	219,589 bbl.	4%
	France	216,597 bbl.	4%
Lub. Oils	—Italy	76,223 bbl.	17%
	Germany	65,401 bbl.	15%
	Great Britain	61,691 bbl.	14%
	Austria	51,044 bbl.	12%
	Bulgaria	47,103 bbl.	11%
	Hungary	33,166 bbl.	8%
	Egypt	31,276 bbl.	7%
Gas Oil	—Greece	278,668 bbl.	18%
	France	254,076 bbl.	16%
	Italy	217,275 bbl.	14%
	Yugoslavia	130,602 bbl.	9%
	Bulgaria	126,890 bbl.	8%
	Hungary	111,599 bbl.	7%
Residual	—Italy	196,911 tons m.	41%
	Great Britain	103,498 tons m.	22%
	Spain	79,912 tons m.	17%
	Egypt	42,125 tons m.	9%
	France	36,740 tons m.	8%
	Yugoslavia	35,208 tons m.	7%
	Austria	35,203 tons m.	7%

A discrepancy is to be noted between Roumanian and Egyptian figures.

Iraq and the Myth of Mosul Oil

Elusiveness of the Oil and Rivalries of Politics Go Hand in Hand to Retard Development of the Mandated Oil Concession

By Dr. Richard Lewinsohn

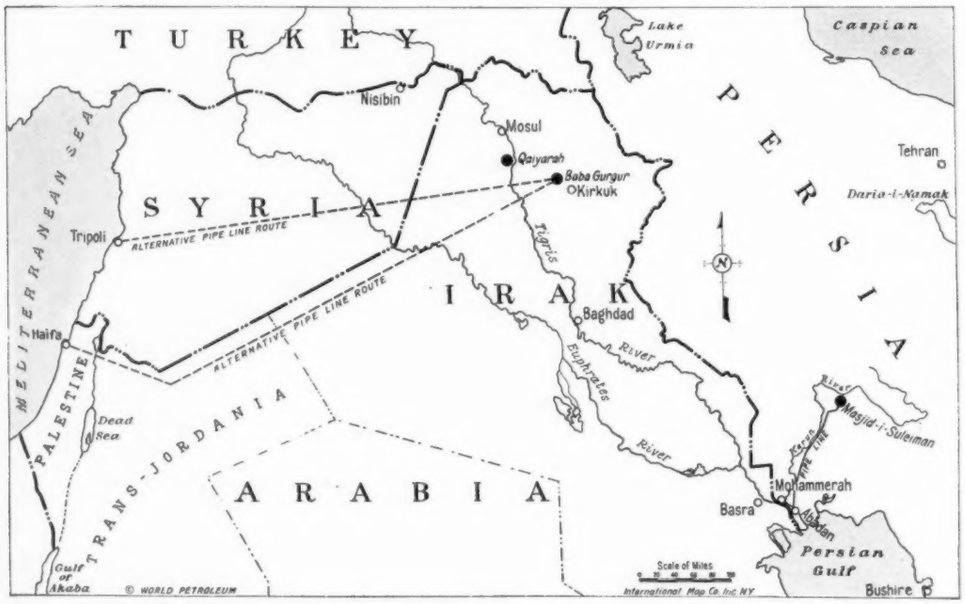
Financial and Commercial Editor, Vossische Zeitung

BABA GURGUR, November.—The first Englishman I met within a short distance of Bagdad, when my automobile broke down, was not what you would call talkative. But when I said I was going to Mosul, he began to thaw out. "To Mosul? So you're an archaeologist! Last summer I went there to recuperate, a nice cool place. Beautiful mosques there. And you'll surely go across the Tigris to Niniveh."

I was a little taken aback, and at first tried in a roundabout way to impress on him that I was going to Mosul really to see the famous oil fields at close range.

"The oil fields? Well, you know—"

Next day, after I had visited Mr. Bull, general manager of the Iraq Petroleum Company, I knew. The old derrick, still standing since the days of the Turks and which never produced any oil worth mentioning, is no compensation for a night's shaking in an Arab train, even though the train be a remnant of the legendary Bagdad railway. And beyond railhead one has to motor over bumpy roads, until finally, 150 kilometers from Mosul, one reaches the world's ideal highway. It has a surface of natural asphalt, unsurpassed by the finest boulevard of any city in the whole world.



This, then, is the wonder of Mosul, which mustered out the peoples of three continents, goaded them to fight as if this district were a treasure house and to wage wars and to stage rebellions, to hold conference after conference and finally to call upon the League of Nations in Geneva as supreme arbiter.

Three years ago, when the Turks finally bowed to their fate and abandoned their claims on Mosul, the English probably had already summed up the whole business as futile, with nothing more to be accomplished than the substitution of Iraq outposts in place of Turkish, in the Kurdistan hills north of Mosul. Economic strategists, already discounting the effects of the third war from the last one, may paint a picture showing perfidious Albion here blocking a Russian sortie to the Persian Gulf. In reality nothing more has happened than that a district, once destined to be a bridge to the South, is now deserted.

Mosul, figuring in the fantasies of the Berlin-Bagdad dreamers as the last station en route to the City of the Caliphs, is today a dilapidated mountain hamlet, with no railroad connections or other means of escape. To get into that fever-hole, Nisibin—the last town on the railroad the Germans built through Anatolia—another day's automobile journey is necessary. Turkey and Iraq, in addition, pester each other with passport regulations. Briefly stated, the Peace of Mosul had the same sequel as many human disorders: Operation successful, patient dead.

The English long ago wrote off these consequences and, for all practical purposes, have abandoned the Mosul district. They did it with characteristic decisiveness, with no qualms about prestige and with no gesture of idealism. As long as they still hoped for oil in the North they continued to extend the German railroad of pre-war days along the Tigris up to the excavations of Samara. There they stopped short on the right-of-way. The rails left over have been used for a new road running from Bagdad northeasterly into the Persian mountains. Here in the meantime engineers had drilled for petroleum and after several vain attempts had struck oil.

Not even here is the yield plentiful, but there is some kind of assurance against a repetition of the myth about Mosul oil. Strangely enough, the best results thus far have been attained by the Khanaquin Oil Company, a subsidiary of the Anglo-Persian Oil Company, that is to say, a purely English concern, in which the British Government participates to the extent of more than one-half. The Khanaquin Company is also the only oil concern which has progressed further than test-wells on Iraq territory—it has a modest production.

The big oil company which is supposed to unearth the riches of Mosul oil is the erstwhile Turkish Petroleum Company, known for the past year as the Iraq Petroleum Company. The English control about half the interest; one quarter was given over after violent wrangling to the Americans; while the other quarter, once belonging to German interests, is treasured by the Société Française des Pétroles. The Armenian, Gulbenkian, who obtained the concession and promoted it, was paid off with 5 per cent of the stock. The aggregation is rather unusual: the keenest competitors in the oil industry, the Royal Dutch-Shell

group and the Standard Oil interests, the keenest competitors on all the oil-battlefields of the world, must exploit the Iraq oil fields in partnership.

This marriage of opposites has not had particularly constructive results. For years nothing of any consequence was undertaken at all. Although according to the terms of the concession the Iraq Petroleum Company should really have notified the Iraq government long ago where the claims are to be staked—what is left over may then be distributed by the government with an open hand—the petroleum engineers are still groping about in this country. The area thus far staked out with a reasonable degree of certainty comprises at most one-seventh of the gigantic concession subject to the primary claim of the Iraq Petroleum Company.

Probably not even preliminary operations would yet have been undertaken but for the sudden appearance of a purely English competing group under the leadership of Admiral Wemyss. This concern, known as the British Oil Development Company duly notified Bagdad that it would be ready at any time to tap the Iraq oil fields in the event that the hybrid Iraq Petroleum Company could not make progress with the undertaking. And, as a good dozen British lords and baronets stand behind the Wemyss group, the notification was taken with due seriousness by the government of King Feisal.

Since that time the Iraq Petroleum Company has quickened its pace. Reports occasionally reaching the outer world to the effect that nothing whatever is being done in the Iraq oil districts do not correspond with the facts. Work is going forward. In Tus Khurmatli, a poor village close to the Persian mountains, a modern barracktown has arisen. English engineers are quartered there, as well as directing officers. Men worth millions of good English pounds have not disdained to set up their headquarters in a rocky desert.

It is a never ceasing cause of wonderment how the English, with no rattling of sabers and with no military show, manage to preserve their authority and maintain their style of life in an environment of Kurds, Persians and Indians, how they make a club-room out of a wooden shack and convert an Arabian harem into a European residence. Even in the desert, among people working at the derricks in a temperature of 122 degrees Fahrenheit, they observe the rules of society and no formality is overlooked. They do not command, but around them is formed an invisible circle of respect, through which no native ventures to break.

Not even English organizing ability, assisted by the most modern American machinery, can, however, raise oil when it

Near Kirkuk, a well of the Iraq Petroleum Company

is not situated at accessible depths. Last year German engineers were brought in to prove up the territory by means of a seismic method. The successful results obtained therewith in America have not been so quickly duplicated here, where the geological structure is entirely different. Trials have been made in 20 locations, but in most of them science has failed equally with the divining instinct of the natives.

Oil is here—that is beyond question—but just exactly where is it concealed, where is that particular square meter into which the drill must be driven? A few months ago an expedition was sent far up into the mountains near Suliman Bey to drill interminably, but now drilling is stopped at 6500 feet. The net result has been water, a débris of rock and useless, dangerous gases, but no oil. In other locations, close to the Tigris, very little better has been done.

The only field which promises to be a big success lies here in Baba Gurgur, in the vicinity of the ancient Kirkuk, the city of the Prophet Daniel, the scene of the Biblical legend of the three men in the fiery furnace, before whose portals the sacred flames have been darting up for thousands of years. And the populace has already resigned itself to the worldliness of these fires: from the neighboring villages come veiled women to hold their cooking pots over the small flames eternally fed by the natural gases from the earth.

A few kilometers further the traveler meets greenish-blue trickles, the atmosphere thickens and nauseates with the hydrogen sulphide it contains. On the ground peculiar growths arise, wrinkled brown-black masses like rotting tree-stumps: coagulated crude oil. Close by on a small elevation stands a small building bearing the number 1. Two years ago an imposing gusher was brought in here—the first and only one thus far—flowing 10,000 tons a day. It has been shut in, because a single well would not be sufficient to permit rational production.

There are laboratories nearby, a small refinery and a settlement of Indians, whom the English bring from Basra for a definite reason. They say that for oil field labor the Indians are much superior to the Persians or even to the Arabians, the latter being altogether useless for difficult manual work. But political considerations are probably also a factor. From the viewpoint of future economic policy in this country it is probably useful to mix races and religions and to utilize the Indians as a counterpoise against the northerly races found there. From two to three thousand men are now active under English leadership, the United States contributing technical men only for the drilling rigs. A young Alsatian engineer from Strassburg may be said to embody the French interest in the Iraq Petroleum Co.

Hard work is being done and with great zeal, but everything is still in the preliminary stages. Whether Iraq is really to become the petroleum country of former expectations nobody on the ground dares to predict categorically. In the last analysis petroleum policies are not determined by the men who create new values here against heaviest obstacles, but by the overlords in London and Paris and New York. They are the ones who make the decisions as to whether it is advisable, from the viewpoint of gasoline prices, to open up new sources of crude oil. It is upon their pleasure that the development of Iraq will depend in the immediate future.

SUBSCRIPTIONS received from many large companies show that they have been quick to realize the value of World Petroleum to their executives and their more ambitious understudies. May we ask you to bring this new publication to the attention of your key men?

Partnerships of British Companies

Collaboration has Replaced Competition in Two Important Markets and is Started in Production By the Three Largest British Oil Companies

By M. E. Day

Institute of Commercial Research

OIL leaders of the Old World are moving towards closer and more intimate contacts. As they adopt methods of co-operation they are led into collaboration. From collaboration they step into minor partnerships.

The trail is being blazed by the Royal Dutch-Shell combine. How far it will lead is not yet clear, but a sketch of its start helps to elucidate Detering's plea for "an association of cooperation" throughout the world.

Royal Dutch-Shell Combine

A world factor in the oil situation, the Royal Dutch-Shell group is fallaciously regarded in some quarters as more British than Dutch. Actually it is more Dutch than British. Originally the Royal Dutch Company and the Shell Transport and Trading Company were separate undertakings. In 1907 the assets of the two were consolidated. Both companies transferred their holdings to the Anglo-Saxon Company and to the Bataafsche Petroleum Maatschappij, the shares of which were in turn allotted to the Royal Dutch and Shell Companies in the proportion of 60 per cent to the former and 40 per cent to the latter. Both the Royal Dutch and Shell therefore are holding companies, jointly interested in the same companies throughout the world in the above mentioned proportions. The ramifications of the group extend over the whole globe. Of their entire business not more than 6 per cent is done in Great Britain.

From the producing point of view the chief countries in which this group is interested are Venezuela, the United States, Dutch East Indies, Mexico, Sarawak, Roumania, Egypt, Trinidad, and the Argentine. Expansion has been most marked in recent years in Venezuela, where the chief subsidiaries of the group are the Venezuelan Oil Concessions, the Caribbean Petroleum Company and the Colon Development Corporation.

In the United States the group owns 72 per cent of the common stock of the Shell Union Oil Corporation, ranking among the 10 largest units in the American industry. Its interest in Egypt is through the Anglo-Egyptian Oilfields, in Roumania through the Astra Romana Co., in Mexico through the Mexican Eagle and La Corona companies, and in Trinidad through the United British Oilfields of Trinidad. The output of crude oil by the companies owned or controlled by the group rose from 13,927,392 metric tons in 1925 to 25,141,800 metric tons in 1929. Last year's production represented about 12 per cent of the whole world's.

Recently the Royal Dutch-Shell group has evinced a tendency towards local mergers with competitors in foreign fields Early in 1928 there was formed the Burmah-Shell Oil Storage and Distributing Co. of India Ltd., to carry on the business of dealers in and distributors of petroleum, motor spirit and other oils in India. This company is the marketing organization of the Asiatic Petroleum Co. (India) Ltd.—a Royal Dutch-Shell subsidiary—and of the Burmah Oil Co. Ltd. The capital is £1,000,000 in 500,000 A shares and 500,000 B shares of £1 each, divided equally between the two partner companies. The Burmah Shell Oil Storage and Distributing Co. of India has forestalled the future competition from the Anglo-Persian Oil Co. in India by making an agreement with the latter to purchase from it a substantial share—and as the market grows, an increasing amount—of the Indian requirements, this applying not only to heavier oils but to all products, including kerosene and motor spirit.

A later development of importance has been the linking of interests with the Anglo-Persian Oil Co. for the distribution of products in Africa. This was effected by the formation at the close of 1928 of the Consolidated Petroleum Company, with a capital of £2,195,100, divided into 109,755 A shares and 109,755 B shares of £10 each. In this undertaking the Asiatic Petroleum Co.—one of the Royal Dutch-Shell group—and the Anglo-Persian Oil Co. have equal shares and an equal representation on the board. The new company acquired all the installations and other distributing facilities of the two partners in East Africa, Egypt, Sudan, Palestine, Syria, the Red Sea and Ceylon, and all the issued capital in companies named below. This association of interests removed the necessity for continued costly duplication of facilities, and it has resulted in a considerable reduction of overhead costs. The countries of North Africa and of West Africa, it is to be noted, were not included in the consolidation, the Royal Dutch-Shell having apparently an acknowledged advantage of supply and marketing in those territories. The companies absorbed are:

Asiatic Petroleum Co. Ceylon	Anglo-Persian Ceylon
Anglo-Persian Egypt	Anglo-Persian Kenya
Shell Co. of Rhodesia	Shell Co. of Egypt
Shell Co. of Syria	Shell Co. of Palestine
Shell Co. of Sudan	Shell Co. of Aden
Shell Co. of South Africa	Shell Co. of East Africa

With the Anglo-Persian Oil Co. the Royal Dutch-Shell group again makes contact in the United British Oilfields of Trinidad, a company which has relatively small production.

Some years ago the Royal Dutch-Shell group made an offer of £4 per share for the British Government's holding of ordinary shares in the Anglo-Persian Oil Co. The offer was refused "in view of the importance of having a nationally controlled supply of oil for the armed forces." Had the offer been accepted the political element would have been removed from the Anglo-Persian Oil Co. The international partnership of the Royal Dutch-Shell and Anglo-Persian with the French and American interests in the Iraq Petroleum Company would probably have functioned more smoothly in consequence.

Anglo Persian Oil Co.

The Anglo Persian Oil Company has an authorized capital of £24,000,000 in ordinary and preference shares, of which £23,925,000 has been issued. There is also outstanding £4,000,000 of 5 per cent debenture stock.

A controlling interest is held by the British Government with 7,500,000 of the 13,425,000 ordinary shares, 1000 preference shares and £199,000 of 5 per cent debenture stock. The total cost of the Government's investment was £5,200,000. How profitable it has proved is shown by the fact that dividends and interest received on it amount to £7,687,940 or nearly half as much again as the original cost. Moreover, the present market value of the Government's holding now is £28,328,630. Political considerations have undoubt-

edly exercised considerable influence in the past and may or not be potent factors at the present time. It is worthy of note therefore that the Anglo-Persian is under such circumstances virtually controlled by the British Government, which has the right, under the terms of the original agreement, to exercise control in matters affecting high general policy.

Only a small proportion of the issued ordinary capital is held by the general public, as shown in the following table:—

British Government holding	7,500,000 shares
Burmah Oil and B. O. C. Anglo-Persian Share Trust	3,561,990 shares
	11,061,990 shares
Total issued	13,425,000 shares
Held by general public	2,363,010 shares

While the company is primarily engaged in the winning of oil in Persia the development of its refining and marketing operations has gradually given to the activities of the undertaking an international character. The consolidation of its interests with those of the Royal Dutch-Shell in South and East Africa and its contract with the Royal Dutch-Shell-Burmah marketing company in India have already been noted. In many European countries the Anglo-Persian has obtained control of, or has established, subsidiaries. Except in the Syndicate for the Exploitation of Oil in Hungary—in which the Burmah Oil Co. participates—there appears to be no linking with other oil interests. The Australian Commonwealth Government, however, is tied up with the Anglo-Persian company in the Commonwealth Oil Refineries, Ltd. and holds 375,001 shares against the 374,999 held by the Anglo-Persian.

A small share interest is owned in the United British Oilfields of Trinidad, controlled by the Royal Dutch-Shell group. The Anglo-Persian is represented on the board together with directors of the Shell and Burmah Companies.

Burmah Oil Company

Through shareholdings, working arrangements and mutual participations the Burmah Oil Co. is interested in and with both the Royal Dutch-Shell group and the Anglo-Persian Oil Company. Originally the Burmah Oil Co. was engaged solely in the production, refining and marketing of Burmah oil. For many years, however, it has been an investor in other oil companies. It had a holding in the D'Arcy Exploration Co. before the Anglo-Persian Oil Co. was formed with the help of the British Government.

The Burmah Oil Co. now owns 2,861,990 ordinary shares in the Anglo-Persian Oil Co. and possesses also 700,000 shares of £1 each, being the entire capital of the B.O.C. Anglo-Persian Share Trust. Inasmuch as the shares of the last-named undertaking are represented by an equivalent number of Anglo-Persian ordinary shares, the Burmah may be said to own or control 3,561,990 Anglo-Persian shares. This holding stands in the books of the Burmah at 13s.4d. per share, against a market value of £3.16s.3d, thus constituting a valuable reserve.

A joint interest is owned with the Anglo-Persian Oil Co. in a syndicate for the exploitation of petroleum in Hungary. The Burmah also has a share interest in the United British Oilfields of Trinidad, on the board of which it is represented together with directors of the Anglo-Persian and of the Royal Dutch-Shell, the undertaking being controlled by the Shell interests.

An association exists with the Royal Dutch-Shell in the Burmah-Shell Oil Storage and Distributing Co., which markets the products of the Burmah Oil Co. and of the Asiatic Petroleum Co. (India) in India. In 1928 the company also acquired a holding of 833,333 ordinary shares in the Shell Transport and Trading Company, which by the exercise of rights has been increased to 1,000,000 shares, the cost being about £4.7s.6d. per share, against a current market value of about £4.15s.

Iraq Petroleum Company

On account of the Royal Dutch-Shell and Anglo-Persian holdings the Iraq Petroleum Co. will be briefly referred to. This company does not present an example of cooperation, because its present set-up actually perpetuates the elements of strife that were focused on it by political exaggerations. Between the two British partners there is, however, complete cooperation in the affairs of this company.

The Iraq Petroleum Company was formed in 1911 as African and Eastern Concessions Ltd., the name being changed in 1912 to Turkish Petroleum Co. and last year to Iraq Petroleum Co. Under a convention ratified by the Iraq Government in March 1925 this £3,000,000 undertaking finally acquired a concession for 75 years. A period of three years was allowed for a survey and for the selection of 24 sites of eight square miles each.

Although the area may be capable, and is believed to be capable, of producing oil in large quantities, operations on a commercial scale await the construction of a much delayed pipe line. The capital is now held in the following proportions:—

D'Arcy Exploration Co., Ltd.	23¾ per cent.	£712,500
Anglo-Saxon Petroleum Co.	23¾ per cent.	£712,500
Cie. Française des Pétroles	23¾ per cent.	£712,500
Near East Development Corp.	23¾ per cent.	£712,500
C. S. Gulbenkian	5 per cent.	£150,000
		£3,000,000

D'Arcy Exploration Co. Ltd. is owned entirely by the Anglo-Persian Oil Co. Anglo-Saxon Petroleum Co. is owned 60 per cent by the Royal Dutch and 40 per cent by the Shell. Compagnie Française des Pétroles comprises French oil and banking interests. Near East Development Corporation is composed of the Standard Oil Company of New Jersey, the Standard Oil Company of New York, Atlantic Refining Company, Pan-American Petroleum Corporation and the Gulf Oil Company of Pennsylvania. C. S. Gulbenkian's participation has been placed in the hands of a company entitled Participations and Investments, Ltd., but the voting of his shares appears to be vested in the British and Dutch groups, which thus control 52½ per cent of the votes.

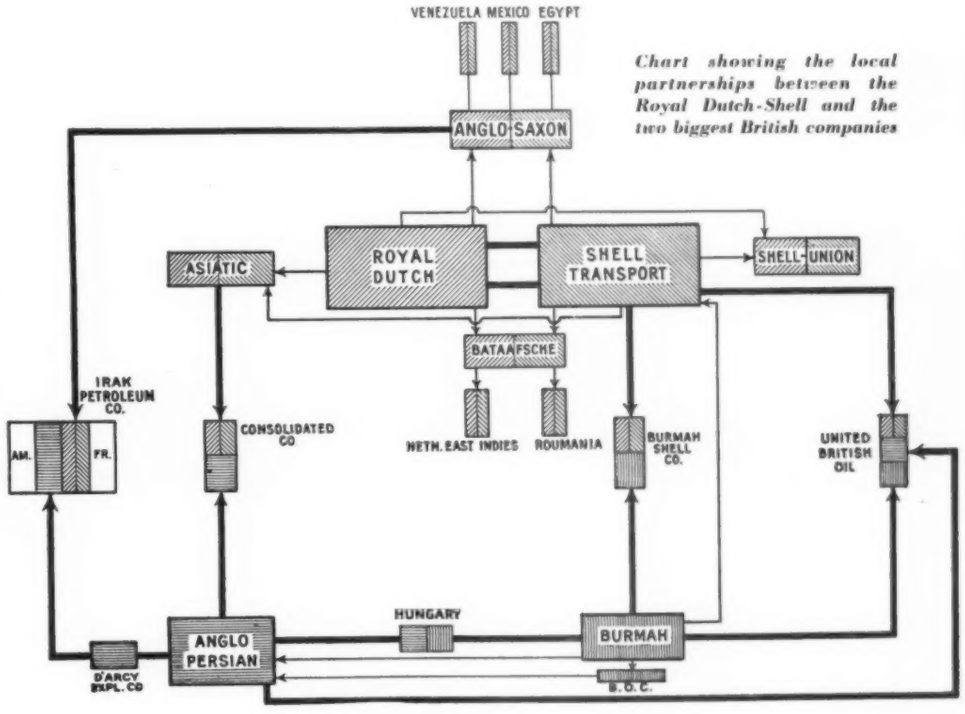


Chart showing the local partnerships between the Royal Dutch-Shell and the two biggest British companies

Alberta Now In 1,000,000 Bbl. Rank

Canada's Oil Province Had Doubled Her Production at End of Last Year and is Going Ahead with a Full Drilling Program

By A. V. Laberge

Agent, Dept. of Natural Resources
Canadian National Railways

THE importance to Canada of the early development of Alberta's petroleum resources can best be gauged from the startling fact that Canada uses in one week the equal of her entire year's production, of which Alberta in 1929 produced 94 per cent, equalling almost a million barrels.

At the present, there are 47 producing wells in the Province, 39 of which are in the Turner Valley, one on the Border near Coutts, one in the Skiff field, and six in the Wainwright-Ribstone field. These figures do not take into consideration commercial gas producers. Though not in Alberta, it might also be of interest to mention the productive wells of the Imperial Oil Company at Fort Norman, on the Mackenzie River in the Northwest Territories. In addition, 179 wells are now being drilled by operating companies in 32 districts in the Province.

While it is being proven, beyond the peradventure of a doubt, that productive horizons can be found in many Alberta fields, development today may still be classed, with the exception of the Turner Valley, as in the information period, i.e., the time between the acquirement of land, survey of surface conditions by the geologist, the information acquired by penetration of the surface, and the commercial production of oil.

It is estimated there are over 200,000 square miles in Alberta where the underlying rocks may be petroliferous. Unfortunately, the large proportion of this area is obscured by glacial drift, and the surface geology gives little indication of sub-surface conditions. The present knowledge of the geology of the Province would indicate that approximately 70,000 square miles give promise of possible underlying structures suitable for the accumulation of oil. Of this area, 18,000 square miles have been geologized, and it is assumed the geological conditions necessary for the accumulation of oil are present. This information must be, and has been in some districts, substantiated by the drill.

Drilling operations in Alberta were first conducted north of Waterton Lakes by John Lineham in 1903. A 20 barrel production was struck at 1080 feet. An attempt made to increase the production at greater depth was fruitless, and owing to caving troubles, lost tools, etc., operations were discontinued at 1400 feet. Another effort was made in the same locality between 1905 and 1907, with but meagre success. A recent news item announces the intention of a Calgary syndicate to reopen drilling operations on this birthplace of Alberta's oil industry.

During the same period the gas fields at Medicine Hat and Bow Island in the south and at Pelican Rapids, to the north of Edmonton on the Athabaska River, were proven by drilling.

The next development of importance was the bringing in of the Dingman Discovery Well, now known as Royalite No. 1, at a depth of 2718 feet in the Turner Valley in May, 1914. The oil was of 55 degrees Beaumé gravity. This well was responsible for the 1914-15 oil boom, when some 600 companies were formed, but few of which drilled.

No marked activity took place between the collapse of the oil boom and 1924, when Royalite No. 4 struck a productive horizon at a depth of 3740 feet and has produced over 500 barrels of 73 degrees Beaumé naptha per day since. This marked a new era in the history of Alberta's oil development. Since that time drilling, particularly in the Turner Valley and Wainwright fields, has gone ahead rapidly, with 87 active wells, in 1926, and more than 100 locations selected. The acreage in the Turner Valley is held by different operating companies, a number of which have an operating agreement with the Imperial Oil Co.'s. subsidiary, the Royalite Co.

Outstanding discoveries since 1926 in the Turner Valley have been Okalta No. 1 in the latter part of 1928, the four

Home Group Vicinity in the Turner Valley, near Calgary, Alberta. Similar scenes are repeated along the Valley, with 39 wells in production and about 100,000 barrels a month being piped to refineries in Calgary

wells in the Home group — Nos. 1 and 3 of which are capable of larger production than the famous Royalite No. 4—and Associated No. 1. Worthy of mention also is the strike, by Merland No. 1, of naphtha from the Dalhousie sands, proving a hitherto dubious section of the Valley. In past operations the Dalhousie formation has been of negligible interest and practically ignored. Today, however, the production of naphtha from this horizon by the Merland commands attention to these sands, and several companies are now testing this formation.

The widespread impetus given to development by the bringing in of Home No. 1 is best evidenced by the following monthly record of deliveries to Calgary refineries—40 miles from the Valley—and comparison of annual production since 1925:

Deliveries to Refineries Turner Valley Only

Month	Barrels	Month	Barrels
January	38,501	July	91,840
February	41,349	August	97,053
March	56,701	September	89,020
April	69,207	October	102,466
May	88,302	November	99,369
June	92,122	December	90,625
Total Deliveries 1929			956,555

Annual Production All Fields

1925	168,643 barrels
1926	219,598 barrels
1927	332,133 barrels
1928	489,531 barrels
1929 (approximate)	998,000 barrels

Had it not been for the continual choking off of Royalite No. 4 and the freezing on Home No 1. in the latter part of the year, the monthly production would have been maintained at 100,000 barrels.

Other interesting discoveries were made by the Devenish Petroleums in the Skiff field in June, 1927—the commercial results of which are not yet known—and the Vanalta wel' near the International Boundary at Coutts in September of last year, indicating new fields in Southern Alberta.

In the Wainwright field, Sasko-Wain No. 1, Beaumont No. 1 and British Wainwright No. 1 were brought in last year, and are now making deliveries to local refineries. Development there would have been much more rapid, had considerable difficulty not been experienced on account of the proximity of water strata to the productive horizons, but it is believed this obstacle may be overcome. Deep tests are now being conducted, and the expectations are that a larger production of light crude may be looked for in the limestone.

In the Ribstone field, the London-Ribstone No. 1 struck oil, but not in commercial quantities, However, the Meridian No. 1 well brought in a good flow of crude oil last year and is now producing on the pump. This strike has considerably accelerated active development there.

A radical departure from fur-trading and merchandising was marked by the appearance of the 250 years old Hudson's Bay Company in the oil industry. An agreement was reached between "The Gentlemen Adventurers of England" and the Marland Oil Company, in which the latter formed a Canadian Company, now known as the Hudson's Bay Oil Company, for the development of the petroleum and natural gas rights owned by the Hudson's Bay Company. Some very important geological and development work has been performed by this company.

The several wells in the lime in the Turner Valley and a number of wells nearing productive horizons in other fields, would lead one to assume that Alberta is but yet on the threshold of the expansion of what should prove to be one of her richest and largest industries. The growing practice of operators, before commencing deep test wells, in testing their holdings by means of a series of shallow bore holes (prospect drilling), to locate accurately the underground structure should prove a boon to the industry. This systematic and conservative method eliminates as far as possible the avoidable expenditure of company funds and has a tendency to place this industry in a stronger light from a financial angle.

Royal Dutch-Shell 1929 Output

ABOUT 12 per cent of the world's total petroleum production is credited to the Royal Dutch-Shell aggregation. In 1929 the total volume of oil produced by this group in all the countries where it has production amounted to over 25 million tons, equal to over 175 million barrels. This represents an increase of 14 per cent over the Royal Dutch Shell production in the previous year, as compared with a 10 per cent increased world production.

More than half the increased output was derived from Venezuela, which showed about 1,675,000 tons more than in 1928, representing an advance of about 22 per cent. Mexico was also a notably larger contributor to the Royal Dutch-Shell total, notwithstanding the dwindling total production from that country. Increased activity on El Aguila properties accounted for the advance of Mexico in the tabulation, a practically doubled output there having more than compensated for the reduction in La Corona output. The higher Mexican figure of 1929 is about 45 per cent above the 1928 Royal Dutch-Shell basis.

In the Netherlands East Indies a gain of 20 per cent was registered, adding three-quarters of a million tons to the total. Shell production in the United States was off, and operations in the Argentine Republic were diminished, but in the other countries there was an advance.

Royal Dutch-Shell statistics are issued in metric tons. The conversion into barrels is made here on the basis of 7 barrels per ton. Other rates of conversion account for higher barrel totals sometimes published, which are misleading.

Comparison of Royal Dutch-Shell Oil Production in 1928 and 1929.

	1929	1928	1929	1928
Venezuela	8,800,100 tons m.	7,125,339 tons m.	61,600,700 bbl.	49,877,373 bbl.
United States	7,532,700 tons m.	7,703,000 tons m.	52,728,900 bbl.	53,921,000 bbl.
Dutch East Indies	4,746,400 tons m.	3,934,045 tons m.	33,224,800 bbl.	27,538,315 bbl.
Mexico	2,061,400 tons m.	1,422,660 tons m.	14,429,800 bbl.	9,958,620 bbl.
Roumania	852,400 tons m.	705,854 tons m.	5,966,800 bbl.	4,940,978 bbl.
Sarawak	759,700 tons m.	751,092 tons m.	5,317,900 bbl.	5,257,644 bbl.
Egypt	271,500 tons m.	268,461 tons m.	1,900,500 bbl.	1,879,227 bbl.
Trinidad	102,700 tons m.	65,187 tons m.	718,900 bbl.	456,309 bbl.
Argentina	14,900 tons m.	50,773 tons m.	104,300 bbl.	355,411 bbl.
	25,141,800 tons m.	22,026,411 tons m.	175,992,600 bbl.	154,184,877 bbl.

International Drilling Congress

Meager Attendance from United States was Deplored by 375 Delegates from 16 Countries in Paris for 2nd Congress of this Series.

By E. J. André

It can now be revealed how the United States oil industry came to be so sparsely represented at the 2nd International Drilling Congress, which was strongly supported by 15 other nations. The Congress was held in Paris last September, and the meager attendance of Americans gave rise to general wonderment among the 370 other delegates.

In several sessions of the Congress the question cropped up: with representatives of 16 different nations present in Paris to prove European interest, why was American support so lacking? Mr. Barthou, Vice-President du Conseil des Ministres, commented upon it, and the regional oil publications did not spare remarks on it at the time.

The Petroleum Times published in London, wrote under the heading, The Paris Drilling Congress Reviewed, ". . . .As to the non-participation of the United States—the home of modern drilling technique and the testing ground of European geophysical research—one can only assume either that that country was not fully informed of the importance and international nature of the Congress, or that America did not think it worthwhile to participate in any official technical sense. Yet if the United States did not think there was anything to be learnt from European practise, surely that country must realize that Europe is anxious to learn from America—for that is the very essence of the reasons for such gatherings. Particularly is this the case with the practical application of European geophysical apparatus. We can only incline to the view that the United States, has not, up to the present, realized the scope and international value of the Congress, and at the Third Congress the work of the Petroleum industry of the British Empire and the United States must be presented and their voices heard in the discussions—then, and only then, will the Congress be truly international."

In Paris La Revue Petrolifère wrote on the subject in its leading article of October 19th. ". . . . The United States now have a personality of their own which is undoubtedly scientifically inclined. They cannot, however, deny that they owe this tendency to Europe, which during past centuries has given the benefit of her culture to America. It is therefore to be regretted that the Americans should now adopt a distant attitude towards their foster family. And if on the one hand it is detrimental to the interests of Europe that the Americans should have abstained from attendance at the Congress, what is to prove that the consequences may not be equally harmful to the United States? In so far as petroleum matters are concerned our interests must be international, and it would be a much wiser policy to adopt and accept the spirit of collaboration."

To be equitable and just we have not come to hasty conclusions with regard to responsibilities, but have made enquiries as to how the United States were approached by the organizers of the Congress for the purpose of obtaining the support of delegates.

Invitations were issued to the President of the American National Committee (of the International Drilling Congress), who in turn was expected to send invitations to all the members of that committee and to other interested persons. The American Petroleum Institute was invited—but we are obliged to state, in justice to the French, that no reply was received in Paris to the invitation, which was a pity. (Equally it should be stated the files of the American Petroleum Institute show no invitation received. Editor). In France, the A. P. I. is looked upon as one of the most important organizations dealing with petroleum matters. That efforts in Europe to further the interests of the petroleum industry elicited no response from that

Side by side in the middle of the front row, from left to right, are Mr. Galliot, President of the Congress, Mr. Barthou, Minister of Justice in France, Mr. Mrazec, Honorary President of the Congress, ex-Minister of Commerce in Roumania, and Mr. Balasinovici, representing the Roumanian Government at the Congress.

American organization was decidedly damping to the ardour of the organizers of the Congress.

Lastly the "Ministère des Affaires Etrangères" sent invitations to the Department of State in Washington, which appointed two delegates to assist—but only as observers!

No trace can be found of any correspondence with all the different associations and institutes which exist in the United States. This was not owing to negligence now was it an oversight. It was merely owing to the fact that in France such matters follow the "voie du protocole," and the Secretariat of the Congress having invited officials considered its duty accomplished.

There is one more point worth mentioning, namely the publicity given to the meeting both in the United States and in Europe. In Europe all the oil publications without exception gave the Congress a maximum of publicity for several months beforehand, with the result that attendance was good. American oil publications were not interested; they remained silent, and the very existence of the Congress was unknown to their readers. A few private individuals did what was in their power to rally some of their friends—in particular Mr. Schlumberger, the eminent French geophysician who has a business organization in America and who was good enough to help the committee to the best of his ability in circularizing all those whom he thought would be interested.

These facts tend to show that American support was lacking at the 2nd International Drilling Congress because of shortcomings on both sides of the Atlantic. A greater effort should have been made by the organizers to advertise it in America, but on the other hand the Americans, who have so many engineers and qualified oil men travelling in different parts of Europe and supervising drilling operations there, could without much difficulty have sent a larger number of delegates. In matters such as these when the interests of the oil industry in general are at stake the French view is the American oil publications could have done a great deal to help had they wished it.

It is to be hoped that all concerned will make an effort in 1931 to constitute the 3rd International Drilling Congress in Berlin a truly world affair, and that instead of hearing comment on the absence of delegates from the United States we shall see their names down on the program with many interesting papers.

THREE hundred and seventy-five delegates representing sixteen countries were present at the 2nd International Drilling Congress. The United States sent only three delegates, namely Messrs. Clapp, Haynes and Shaler.

These meetings were started by the Internationaler Bohrteckniker Verband of Vienna which launched the idea in 1923. The first Drilling Congress was held in Bucharest in 1925. It was attended by 700 delegates representing 20 countries, who decided at the time that much important drilling data was lost to science.

The work undertaken by the 2nd International Drilling Congress last year can be divided into three parts:

(1) a description of modern drilling methods and equipment;

(2) drilling operations undertaken in certain European countries;

(3) geophysical research work.

In the United States the Official Invitations Were Received Too Late for Real Action, and Important Societies Were Entirely Overlooked

By a Staff Writer.

NOT until six weeks before the date set for the assembly of the 2nd International Drilling Congress in Paris was the official invitation received by the American Government from the hands of the French Ambassador in Washington.

The notice was all too short, particularly in the summer season when so many people were away. The State Department promptly communicated with the U. S. Geological Survey which, having no funds available for a delegation of its own, enlisted the interest of the National Research Council.

Ironically, the Division of Geology and Geography of the National Research Council which had been interested in the preparations for the Congress, did not receive an invitation directly. That Division receives the reports of the Committee on the Conservation of the Scientific Results of Drilling, an activity of the National Research Council under the chairmanship of Wilbur A. Nelson, Professor of Economic Geology and Stratigraphy at the University of Virginia. The work of this committee received particular praise when presented later at the Congress in Paris, yet it came near being missed altogether.

The National Research Council, established by the National Academy of Sciences in cooperation with the national scientific and technical societies of the United States, endeavored in early August to locate geologists and engineers who could attend the Congress. (The International Geological Congress in Pretoria, S. Africa clashed with the Drilling Congress in Paris).

Finally two were found in Europe: Frederick G. Clapp, petroleum geologist and engineer of New York and Paris, and Millard K. Shaler, geologist and engineer of Brussels. They were appointed official delegates of the United States Government, on the advice of the U. S. Geological Survey.

The belief in Paris that the United States appointed no official delegates, but only observers, grew out of the nomination of Winthrop P. Haynes, petroleum geologist of Paris, as unofficial observer.

Actually the United States is not officially connected with the organizations of the International Drilling Congress. That may be due to an oversight on the part of the Comité d'Organisation. It was by error that the sectional committee of the National Research Council, with W. A. Nelson as chairman, was listed in the circulars of the International Drilling Congress as the "National Drilling Committee of the U. S." The error can be repaired before the date of the Berlin Congress.

None of the American technical societies were represented officially in Paris. The American Association of Petroleum Geologists was not directly invited to appoint delegates. The American Institute of Mining and Metallurgical Engineers received a general invitation, but, after considering the previous Congress at Bucharest, considered the meeting likely to develop along lines more especially interesting to geologists and decided therefore not to participate.

The most remarkable omission occurred in the case of the American Petroleum Institute. Like the American Association of Petroleum Geologists the A. P. I. received circulars—but no invitation. The A. P. I. was, however, solicited to give the names of a large number of American oil men, though it is not evident why American oil men should go to Paris to attend a conference on the drilling of oil wells.

It would thus appear that the failure of a numerous American attendance at the International Drilling Congress in Paris last September was due to lack of invitations and to an inadequate period of notice. Under the handicap of such difficult circumstances the attendance of three American delegates was deserving of the tribute of the Drilling Congress in place of adverse comments.

Deep Drilling Practice and Equipment

Technics of California Methods outlined for Drilling Engineers in other Countries

By D. R. Thompson and L. E. Porter

Asst. Mgr. of Production, Richfield Oil Co. — *Chief Geologist, Richfield Oil Co.*

SUCH present by-words of the Petroleum Industry as Progress and Speed prove stumbling blocks to any article written on accepted modern practices, because of the rapidity of this industry's progress in these particular fields.

Continuous and progressive development of the deeper and deeper oil zones in the several Southern California oil fields during the last five years, has taxed the ingenuity of the petroleum engineer and of the manufacturer of oil well equipment to the greatest degree—of the former to develop means for keeping track of the wandering bit and of the formations penetrated, and of the latter to construct sturdy enough equipment to meet the ever-increasing weight brought about by the deeper drilling of the wells.

The crude tools of early days have given way to instruments built to gauge in fractions of an inch precision. The personnel, too, is changing—beef and brawn is now being tempered with training and technical education. The wastage of co-products of petroleum as practiced in former years now is utilized to pay for development costs.

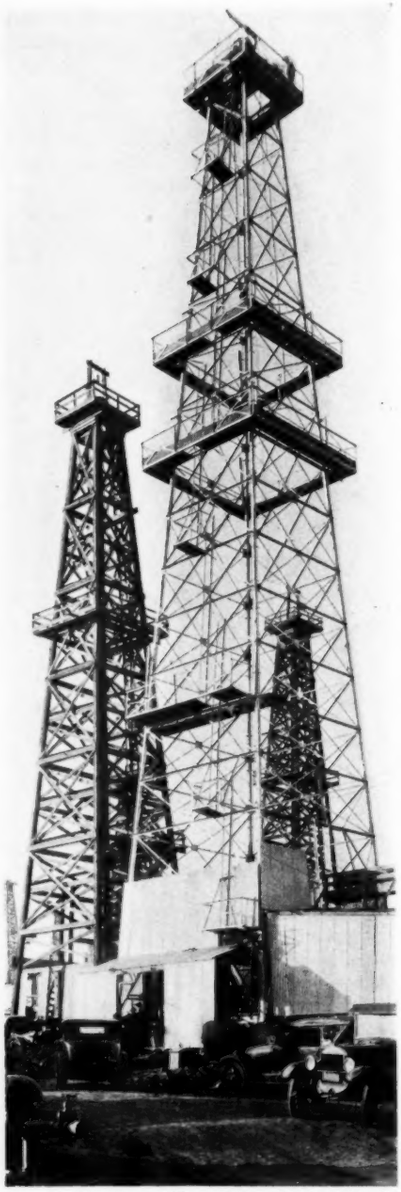
It is thought better to give a description of the drilling of a modern deep well in California's most spectacular field, namely, Santa Fé Springs, as the method best to exemplify to the reader the latest practices and equipment used in the completion of the average deep well. This description will briefly point out the salient features, from the selecting of the location to the time of turning the oil into the flow tanks.

Typical Deep Well

1. LOCATION. The location is generally made by a geologist or petroleum engineer with the idea of locating the well in a favorable structural location. Stakes are then driven and preparations made to put in the derrick corners.

2. CORNERS. The derrick foundation consists of concrete poured into forms at each derrick leg. Concrete blocks are then put upon them for the support of the derrick sills and struts.

3. DERRICK. Much progress has been made during the last few years in the construction of derricks. The wood frames are rapidly being replaced by those of steel construction. The base for deep well drilling is generally 26 ft. x 26 ft. and the height varies from 130 ft. to 136 ft., depending upon the desired depth to be reached by the drill.



Western Pipe and Steel Co. of Calif.

New type 136 ft. steel derrick—A. P. I. specification

The average cost for wooden derricks with rig irons amounts to approximately $5300, whereas those of steel vary in price from $7000 to $7500 complete. The saving or difference in price is often a debatable subject, but in the event of town-lot drilling it seems the steel derrick would have the preference over that of wood. Conditions, however, should govern the choice of the material from which the construction is to be made.

4. RIGGING UP. As soon as the crown block has been placed, rigging up is begun by moving in the rotary equipment, mud pumps and miscellaneous materials for use in the drilling of a well. The type of rotary equipment generally used consists of engines powered by either steam or electricity, together with high and low pressure mud pumps. Electricity as power is slowly gaining its place as a dependable and sure means of drilling oil wells at lesser cost.

Conditions govern again the selection of electric power or steam. Town-lot areas and inaccessibility of water or electric power lines are the principal factors in making the selection of the type of power to be used. Steam driven rotary equipment costs approximately $25,000, whereas the electrically driven motors cost $35,000.

The lapse of time from the staking of a location to the completion of the derrick ready for the spudding in of a well is generally of about two weeks' duration.

5. SPUDDING IN. Most of the companies operating in the deep zone fields spud in with a 22 inch or 24 inch hole. This large hole is necessary in order to set large casing, and it is carried to a depth of from 500 to 900 feet, where the surface or stovepipe casing is set preparatory to drilling ahead, generally with 6 inch drill pipe.

6. CASING PROGRAM. The average casing program for a Santa Fé Springs well usually consists of:

18 inches or 20 inches	cemented from 700 ft. to 800 ft.
11¾ inches to 13⅜ inches	cemented from 4100 ft. to 4400 ft.
8⅝ inches or 9 inches	cemented from 5600 ft.
6⅝ inches	cemented from 6400 ft. to 6600 ft.
4½ inches landed about	7600 ft.

The casing program is strictly dependent upon the location of the well in the field. At this writing a new style of casing is on the market called the inserted joint type

which allows a much better program in the completion of a well. Such program with the inserted joint type would be:

$13\frac{3}{8}$ inches.....cemented at 4200 ft.
$10\frac{3}{4}$ inches.....cemented at 5600 ft.
$8\frac{5}{8}$ inches.....cemented at 6400 ft. to 6600 ft.
$6\frac{5}{8}$ inches.....cemented at 7600 ft. to 8500 ft.
$4\frac{1}{2}$ inches.....oil string landed at 8500 ft. plus

The manufacturers of this inserted joint casing state that such casing is even stronger than the regular collar type.

7. Drilling Procedure. Once the casing program has been decided upon the proper size bits are of course selected to drill the necessary hole. To complete a well to 7200 ft. takes from 125 to 185 days, dependent upon the amount of trouble encountered while drilling. California State Law places the drilling of oil wells under what is known as the California State Mining Bureau and wells drilled in California must comply with uniform regulations as laid down by this Bureau. The principal one concerning the average drilling department is that adequate protection must be afforded to all producing horizons penetrated and proper notices and tests of water shut-offs for each string of casing set must be given and witnessed by the Bureau.

The various strings of casing are generally cemented with apparatus furnished by the cementing companies. The texture and mixture of the cement conforms to modern practices, which will be discussed under the heading of cementing later on. From 300 to 350 sacks of cement are used in cementing large strings of casing and from 100 to 150 on the smaller strings, depending upon the type of shut-off and on the head of water to be placed behind the string.

Considering that the well has penetrated the producing oil zone, a water string is landed in a suitable shale body or sandstone shale above the producing horizon and cemented off. The test of water shut-off is made by bailing down the fluid in the hole to the required depth as required by the California State Mining Bureau and allowing it to stand for a given period of time, generally 12 to 24 hours. Provided there is no rise in the interim, the test is considered a shut-off. It is always customary before testing the water shut-off to make a bailing test of the casing to see that all joints are tight.

After the water shut-off test has been made the well is drilled ahead through the oil zone or to the required depth, and a string of perforated pipe is run, known as the oil string. This perforated pipe consists of perforations or holes placed in the casing opposite that portion which is to be set in the producing horizon. These holes or slots vary from a very small fraction of an inch in diameter or width to as great as $\frac{1}{2}$ inch to $\frac{3}{8}$ inch width or diameter. The size or mesh of the perforations is generally quoted in thousandths of an inch so that

Western Pipe and Steel Co. of Calif.

Welding special oil well casing as it is being run into the hole

250 mesh slot would be $\frac{1}{4}$ inch diameter, 500 mesh would be $\frac{1}{2}$ inch diameter, etc.

8. Completion of Well. Once the oil formation has been penetrated and a string of casing set above the producing formation and cemented off to exclude the infiltrating water from above the producing formation, a string of perforated casing is generally set through the oil zone. With this done, the well is ready for completion.

Gas pressures in the Santa Fé Springs Field vary from 800 lb. per square inch to 1400 lb. per square inch; therefore considerable care must be used in bringing a well in on production. A string of $2\frac{1}{2}$ inch or 3 inch tubing is run to the top of, or down to, the perforations, depending upon the depths selected by the petroleum engineer, and the tubing is then landed at the casing-head. A series of flow-nipples and valves are then rigged up above the tubing and casing head and constitute what has become known as a Christmas tree.

The Christmas tree is so constructed as to represent a T-head with a flow line on either side of the T. Dual flow lines are used for the control of the well. Flow beans are inserted in each flow line and the valves so arranged that when one line is open the other may be closed down for the changing of the flow bean, which is frequently cut by sand issuing from the well. Pressure gauges are then attached and the well brought in, usually by swabbing. A swab is run down through the tubing and pulled back up, bringing the fluid with it.

Most wells in the Santa Fé Springs field require only a few runs with the swab to start the well flowing of its natural accord. The flow is through the tubing, up through the T-head and out through the flow lines. Once the fluid is cleaned up and the water and mud replaced by clean oil it is turned into the production tanks.

Conclusions. The above paragraphs have taken briefly, step by step, the pro-

cedure as worked out in the Santa Fé Springs field. There are many points which could not be discussed in these few paragraphs, but an attempt will be made to give the reader some idea as to the problems met in putting a well down to depths below 5000 ft. These problems will be discussed under their separate headings, which are really specialties and should receive special attention.

Coring Practice

The use of the core barrel in the drilling of deep wells is of the utmost importance. In fact, it is strictly essential as a definite part of drilling procedure to determine:

1. water shut-off points,
2. character of formations penetrated,
3. the proper place to stop the drill.

Coring eliminates the element of guesswork to a great degree and in addition affords sufficient data to reduce oil well failures to a minimum.

A good example of the value of the core barrel to the operator is shown in that new, but now famous, oil field of Kettleman Hills, located in the San Joaquin Valley of California. The character of the oil (55 degrees-61 degrees A.P.I.) in this field is such that, without cores to take the proper cuts of the formation, it would be impossible to make either a successful completion or shut-off. Since these wells are being completed at depths averaging about 7000 ft., the reader will at once understand that a failure of one well or so could easily spell financial ruin to the operator.

There are several core barrels on the market which are recommended. These barrels are of the detachable cutter head type with the removable inner barrel—similar to the one illustrated here.

Core barrels are manufactured in the following sizes:

Diameter of Core	Size Core Barrel Standard	Cutters Maximum and Minimum	Size Drill Pipe Generally Used
1¼"	4½"	3⅞" to 5"	2" to 2½"
1½"	5¼"	4½" to 5½"	2½" to 3"
2" to 2½"	5⅝"	5⅝" to 6¼"	2½", 3", 4"
2½"	6⅝"	Up to 6¼"	3" and 4"
3"	7⅝"	Up to 9"	4", 5" and 6"
4"	9⅝"	Up to 11"	5" and 6"

Elliott Core Drilling Co.

Cross section of a core barrel

Special Cements

Cementing and the development of special oil well cements is, for deep well completions, the next in line of importance to coring. One of the most difficult problems encountered in the completion of wells to producing zones below depths of 5000 ft. is to shut off water adequately and prevent its infiltration into the oil bearing sands, as well as to prevent the dissipation of both oil and gas from zones of high pressure into those of comparatively low pressure.

The procedure for keeping out water and preventing the dissipation of gas requires very precise and particular work on the part of both the driller and the engineer. The greater and greater depths afford more and more difficulties to be overcome. Among them are the ever increasing temperatures encountered at excessive depths, which break down the setting efficiency of common oil well cement. Temperatures in excess of 200 deg. Fahr. have been encountered in the Santa Fé Springs and Long Beach oil fields.

Elliott Core Drilling Co.

Detachable head showing core catcher

Only after repeated failures in trying to make proper water shut-offs did the operators find that the cements were the cause of well failures. At first the cement manufacturers tried to explain to the operators that drilling practices would have to adjust themselves and conditions be promoted under which the common types of oil well cement would set. Those requirements were quite unnatural, as of course the cement manufacturers soon realized. Therefore within a few weeks special oil well cements began to appear upon the market, so made as to overcome the difficulties. These special cements are manufactured to meet the conditions of high pressures and high temperatures, and they are suitable only for making water shut-offs and for plugging operations in wells with temperatures above 150 deg. Fahr.

Another factor entering into the cementing operations is the time element. The greater depths at which casing has to be landed and cemented increases the time element to such a degree that ordinary cement can set in transit to the shoe of the casing. This difficult problem too has been overcome by both the cement companies and the cement makers, by the former in developing machines of larger capacity which puts fluid away more rapidly and by the latter in mixing the cement to prolong the setting time.

Very little improvement has come about in recent years over the two plug method of cementing except in the development of larger capacity machines and more efficient methods of mixing the cement. Field engineers have determined, however, a factor of importance to be the increase of the efficiency of the cement mix. It has been found that unless cement possesses the right slurry the increasing temperature and time before the cement is in place tends to break down the setting action of the cement to such a degree that the high pressure in the well soon overcomes the feeble set of a poor mix. The proper slurries of cement have been found to vary with field conditions. Therefore each job has to be treated individually.

Crooked Holes

The most perplexing problem confronting the deep well operator today is to drill a straight hole. Assuming that no oil well can be drilled absolutely vertical one might say it would be foolish to try to drill one. So it would be,—but when the bit has a tendency to wander at times more than a quarter of a mile horizontally from the point of spudding, the driller's problem indeed becomes serious.

Many recent innovations have been developed, beginning as early as the latter part of 1928, for controlling deep well drilling, but none have yet been developed which insure an adequate control on the bit in drilling wells below 4500 ft. It is thought advisable to acquaint the reader with some of the most important features developed by the surveying of oil wells.

Surveying of petroleum wells is of comparatively recent introduction, although similar surveying has been known in the mining industry for many years and is used to find the deviation of diamond drill holes. Most practical drillers, even as late as 1928, contended it to be impossible to drill a crooked hole, but engineering work done since that time has definitely proved the reverse to be true—it is almost impossible to drill a straight one.

It has been found that a crooked hole indicates to a driller that there is:—

(a) uniform wear of drill pipe and drill collars alike,

(b) no apparent difficulty in making footage (some of the most rapidly drilled holes are reported the most crooked),

(c) easy drilling does not indicate a straight hole (some of the wells showing the greatest deviation by survey have been reported by drillers as among the easiest wells drilled).

Some of the difficulties experienced in drilling crooked holes are:—

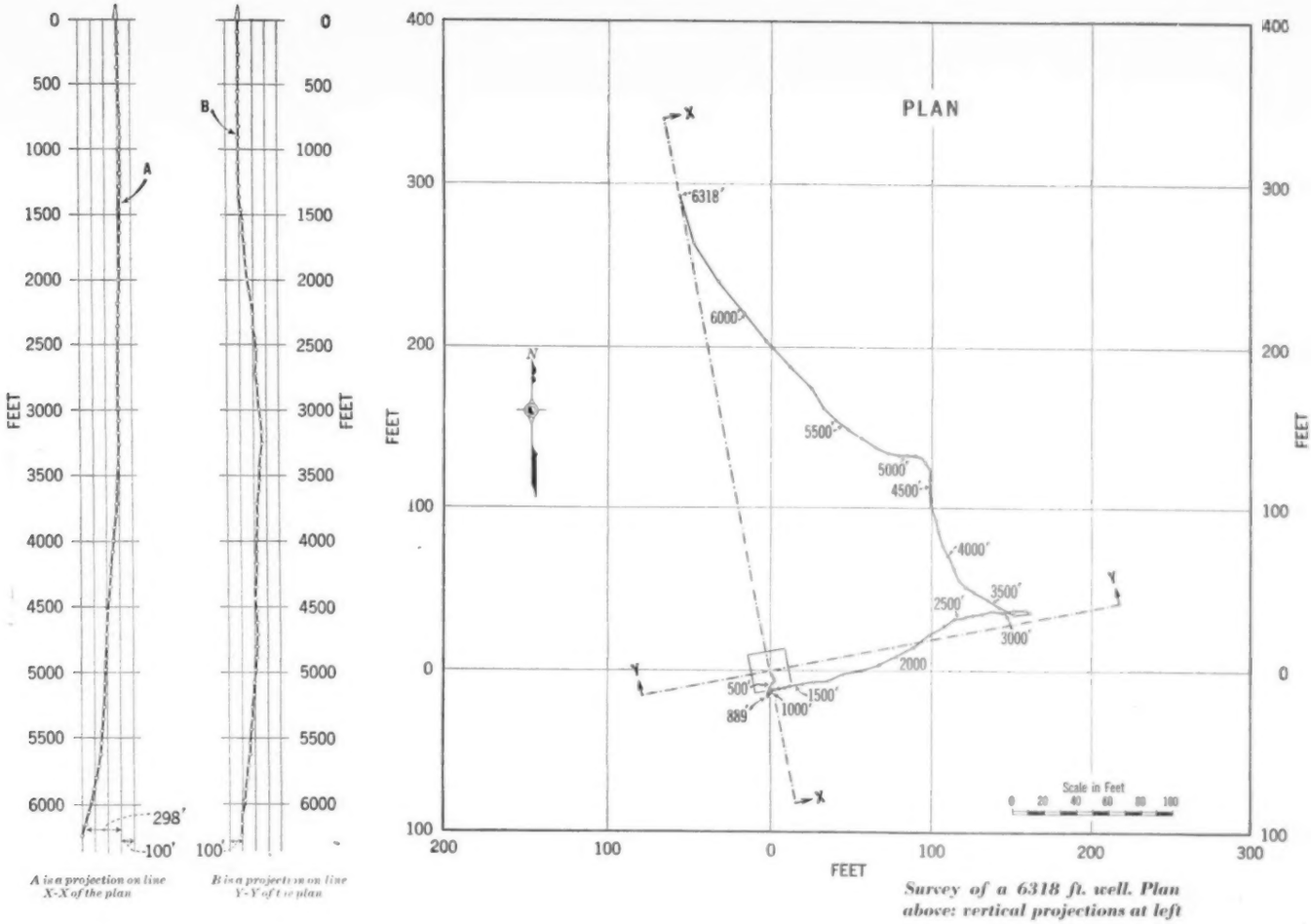
(a) casing frequently collapses,

(b) tubing in a crooked hole wears out rapidly,

(c) practically impossible to clean out some of the deepest wells drilled, because of their crooked conditions,

(d) crooked condition of holes increases rod strains and breakage to the degree that pumping becomes prohibitive.

A majority of the surveys have revealed in most fields and in instances in California



Survey of a 6318 ft. well. Plan above: vertical projections at left

that wells down to 4000 ft. or 4500 ft. are comparatively straight. The Santa Fé Springs wells are comparatively straight down to a depth of approximately 6000 ft., whereas in Long Beach, due to the character of the formation, the holes are rarely ever straight below 4500 ft. A study of a great many surveys has also revealed that once drill pipe has been changed from 5-inch or 6-inch to 3-inch or 4-inch the drift most always begins to appear as the hole proceeds downward. Frequent cause of crooked holes has been noted to be the drilling of hole after the setting of large size casing such as 11 ¾-inch and 13 ⅜-inch at depths between 4000 ft. and 5000 ft. This again involves the change in size of drill pipe.

Many surveys in town lot areas have revealed holes drifted even from the surface when speed has been the prime object. Wells have deviated as much as 1650 ft. horizontally from the derrick floor for depths between 5000 ft. and 5500 ft. of hole drilled. Investigation of holes which began to deviate at the surface have in some instances shown that the derricks have been out of line and that frequently the kelly has been out of plumb at the spudding of the well.

The conclusions reached in general drilling practice are that holes should be straightened in the first few hundred feet in which they have been observed to be going crooked. Such holes may be straightened by plugging back, by redrilling or by careful reaming, until they assume a more or less vertical position.

New types of bits.

The use of side drag, or eccentric, bits seems to be preferable over the old type of disc and fishtail bits, but one type of bit in one field may drill a straight hole, whereas the character and dip of formations in another field will cause the same type of bit to drill a crooked hole. This much has been learned, that speed or footage is frequently re-spelled into "wastage" of both money and time because of the crooked holes drilled. Much money is now being spent in California to correct crooked holes after the casing has been set. The practice should be not to set casing in crooked holes. The new makes of casing show such resistance to side-tracking and drilling-through that costs become prohibitive in straightening wells in which casing has already been set.

The proper procedure is to survey the well often by the use of acid bottles. A common practice in California today is to place an acid bottle in a metal torpedo and drop it through the drill pipe, allowing the acid to etch the bottle to its degree of inclination, and then pull out the drill pipe. This practice is sufficiently accurate to give the driller a key as to when his hole is going crooked. It also conserves time, because the survey need not be made until a bit has been dulled; thus the reading can be brought out at the same time that a new bit is put on. The acid bottle data can then be checked by one of the several methods of surveying now in common use in the California fields.

The one shortcoming of the modern surveying instruments is that they do not account for the natural torque developed by drill pipe following a crooked hole; therefore the given orientation of holes is somewhat distorted. However, they are the best developed to date and much saving can be had by using them.

Many types of bits and reamers developed during the past year are drilling straighter holes than the old types of fishtail and disc bits. These bits, however, with their new metal facing have to be used differently, which necessitates educating the drillers.

The proper way to drill can only be worked out by continuous observation of what certain types of bits and practices do in each individual well. In other words, it seems the problem has resolved itself down to continuous consultation between the driller and the engineer in hopes that better practices will result.

An International Refinery Center

In Caribbean, a Strategic Center of Transportation, New Plants and Extensions are Being Erected by Companies of Several Nations

By T. Orchard Lisle

CURACAO was the naturally indicated location for Royal Dutch refinery when that company was able to count on production in Venezuela and was expecting to develop a concession—since changed ownership—in Colombia. For Curaçao, possessing at Willemstad a splendid, sheltered deep-water harbor, is under the flag of Holland, lies in proximity to the bountiful Maracaibo Basin and is not overdistant from the Colombian coast.

Moreover, Curaçao is ideally situated for the distribution of refined oil products to Atlantic ports of the U. S. and Atlantic ports of Europe, in addition to the Canal Zone, Pacific and Atlantic coasts of South America and half of Africa. It is favorably situated also to draw from the eastern section of Venezuela, as soon as the fields there open up extensively, and it is excellently located for the intake of crude from Trinidad.

With the selection of Curaçao as the site of the refinery of the Curaçaosche Petroleum Industrie Maatschappij, a subsidiary created by the Royal Dutch for this purpose, the foundation was laid for a great refinery industry in the Dutch West Indies. Today the Curaçao refinery is one of the biggest in the world, and on the nearby Dutch island, Aruba, are two refineries, one owned by the Lago company and the other by the Arends Petroleum Co., subsidiaries respectively of the Standard Oil Co. (Indiana) and of the Mexican Eagle Oil Company.

When on a visit last year to the oil fields of Venezuela and Trinidad and to the refineries of Curaçao and Aruba, the writer was forcibly impressed by the activity in refinery extensions and in the erection of new refining plants.

Probably the Royal Dutch refinery at Willemstad, Curaçao, complete with 2,500,000 bbl. tank farm, deep water loading piers, dry-dock, topping and cracking units, can plant, workshops, hotels, housing development, clubs, swimming beach, etc., is of the most interesting in the world. It is one of the largest.

Commenced in 1917, construction was delayed by the war, and not until 1924 was it completed to its present substantial size. I say completed, but the refinery was undergoing extensive additions at the time of my visit. Last year no fewer than 50,000,000 barrels of crude oil were refined. Over five million barrels every 30 days are now actually being transported to Curaçao, demonstrating a steady growth.

At present about 8000 men are employed in this 147,000 barrel-per-day plant, and the number of salaried employees is steadily increasing, as well as unskilled labor, to meet the capacity of 250,000 barrels to which it is now being brought on account of the Shell's latest activities in New York and in New England States.

Under construction were eight Dubbs cracking units for fuel oil and three Trumble plants for handling crude oil. In operation were six Dubbs and ten Trumble units, while two Cross cracking plants for handling solar oil are in use when required.

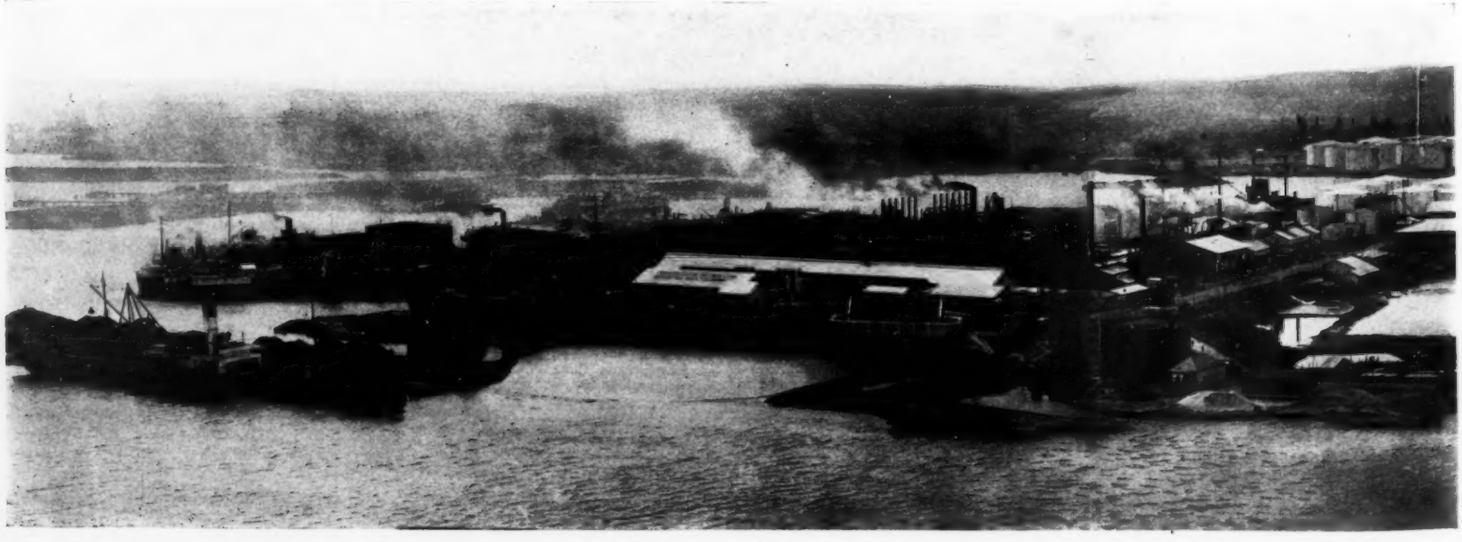
About 50 per cent of the equipment in the refinery was purchased from the United States, and the other half from Europe. In fact, at the time of my visit, J. Noorduyn, the refinery manager, was in The Hague to recommend purchases for further plant extension, following a visit to America where he made a study of the latest equipment. C. E. van der Stok, director of the plant, also was in Holland, and the courtesies of the refinery were extended to me by A. N. Glazener, acting director, at the request of Richard Airey, president of the Caribbean Petroleum Co.

All purchases of American equipment are made through London and The Hague (via the New York office) but, obviously recommendations of officials at the refinery are weighed when the selection is being made, and price is not the deciding factor.

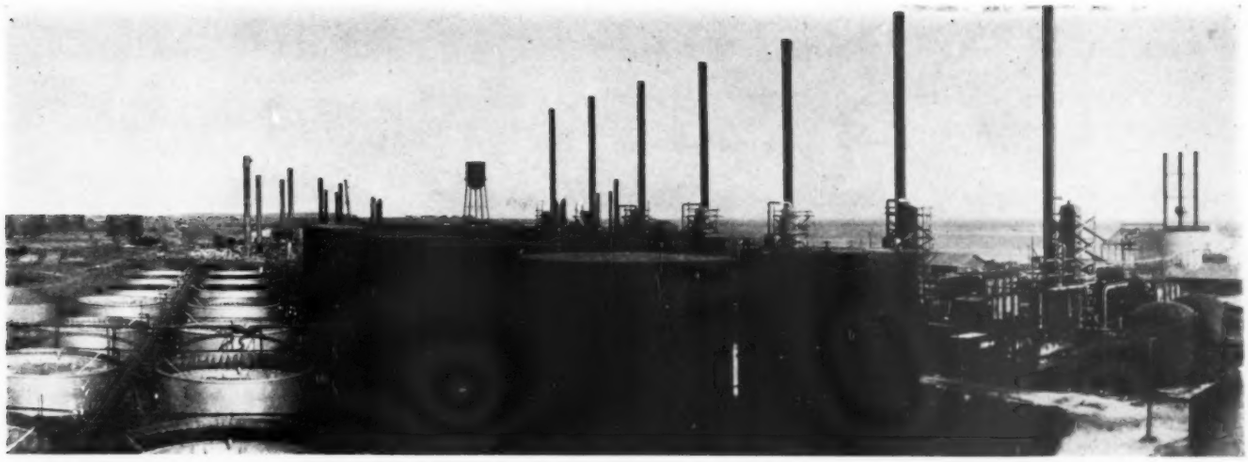
The Royal Dutch has, in conjunction with these refinery expansions, completed four new loading piers at Caracas Bay, as well as the construction at Bullen Bay, west of Willemstad, of a new plant for storing, mixing and shipping gasoline.

The new refinery of the Lago Oil & Transport Company at St. Nicholas, Aruba, which is now the South American development interest of the Standard Oil Company of Indiana, through the Pan-American Petroleum Company, is not yet complete. Aruba is another small Dutch island off the North Venezuelan coast, and is located in an equally fine distributing position as Curaçao.

An aggregate of close to $11,000,000 is being invested in this plant, of which the refinery alone represents $7,400,000. When completed it will have a capacity of about 110,000 barrels a day. At the time of my



Curaçao refinery and loading piers of the Royal Dutch in the port of Willemstad



Battery of cracking units and tanks in one section of the big, new Lago refinery at Aruba

visit, the topping plant was in operation and several of the eight Cross units that are being erected. There will also be eight pipe stills. Storage tanks of about 2,000,000 barrels capacity are being erected. Electrification of the refinery is claimed to be the most complete in the world. All the equipment is of American manufacture.

A recovery of 33 per cent of gasoline by cracking is expected from the new plant, which would give about 10,000,000 bbl. of motor fuel annually. The cost is also expected to be lowered by the numerous improvements introduced into equipment and operation.

Also on Aruba is the new 16,000 bbl. topping plant of the Arends Petroleum Co., another subsidiary of the Royal Dutch-Shell interests. It is reported to be a model of its kind.

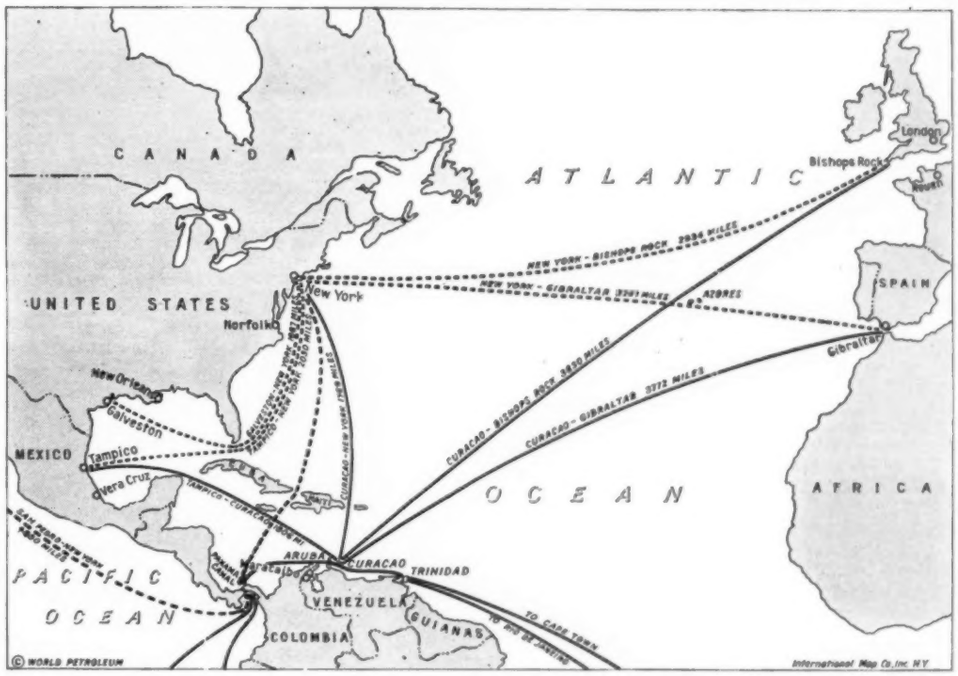


Chart showing commercial strategic location of Curacao and Aruba in relation to markets.

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Tankers coming, tankers going, a total of 50 crosses Maracaibo Bar at the top of the flood tide

Maracaibo Fleet Carries 50,000 Tons a Day

Seventy Eight Tankships Engaged Exclusively in Exportation of Venezuelan Oil Production

By Captain W. C. Clark

Marine Agent, Maracaibo
Venezuela Gulf Oil Company

PRACTICALLY unknown to the great majority of the teeming millions of the New and of the Old Worlds, the face of nature in Morgan's old stamping ground in the Spanish Main has been completely changed from a tourist paradise to a hive of industry which has in a few short years placed Venezuela second in the whole world for the production of petroleum.

In the first year of operation, for which there are very complete records, namely 1921, the average exportation of all classes of petroleum from Maracaibo Lake was 400 tons per day. For the first nine months of 1929, the average exportation from Maracaibo Lake alone has aggregated well over one hundred times that amount. Last year it averaged over 50,000 tons per day. This article deals with the means whereby this astounding expansion has been made and for this purpose attention will be paid only to the oil exported from Maracaibo Lake, because the problem in Eastern Venezuela, where a comparatively small quantity of petroleum is being produced, is not limited by water transportation.

To understand thoroughly the situation some knowledge of the characteristics of the area covered by Lake Maracaibo, the Gulf of Maracaibo and the southern part of the Caribbean Sea, is required. Lake Maracaibo resembles an inland sea. It is fed by a large number of rivers during the rainy season, and at the same time is in direct communication with the tidal water of the Gulf of Maracaibo—or Gulf of Venezuela, as older men know it. Some effect of this tidal movement is felt for over 30 miles from the sea, or nearly one-third of the length of the Lake. Being about 100 miles long and spreading from a bottle neck at its junction with the sea to a maximum width of 57½ miles, this large expanse of water is subjected, like the sea, to considerable disturbance from the prevailing trade winds and from the terrific squalls which pass over it in summer. From below the waters on the margin of this Lake, on its eastern side, by far the greatest quantity of the colossal amounts of petroleum produced in Venezuela has been taken.

The only city of any importance on the Lake is Maracaibo itself, situated in a particularly inconvenient position for the handling of the developments necessitated by the expansion of the marine transportation. Such facilities as exist on the spot in most other ports of the world have had to be created in this area, long distances away from the only business and residential center available.

Maracaibo city has probably doubled its population within the last nine years. At the time when this story opens, export activities were few and small and were centered on the coffee crop. Probably it would be true to say that nine years ago all the foreign trade of Maracaibo was covered by a total of 100 entries and clearances of vessels at the Custom House monthly. Today, the entries and clearances in one month exceed 1600, yet the population of the city is not more than 74,000.

In the greater portion of the Lake the depth of water is such that the largest vessels can be navigated to within a comparatively short distance from the shore. The entrance to the Lake is from the Gulf of the same name, of which latter the Lake appears to be an extension created by inundation. The land which earlier formed the southern boundary of the Gulf of Maracaibo was not completely swept away to the same depth as what is now the lake bed itself. An area about 14 miles in length at the northern end of the Lake is consequently restricted by sand bars.

Gulf Oil Company tankers at anchor off Maracaibo

Fortunately, the scour of the tidal water kept open a channel over the bars which, so far as is known, have always been navigable at least by vessels of 10 ft. draft. The channel is narrow and tortuous in most of its length of 16 miles from the outside of what is known as the "outer bar" to the inner side of the "inner bar," known locally as the Tablazo.

From the outer bar Maracaibo is distant about 30 miles, La Rosa Field about 55 miles and Lagunillas Field about 77 miles, into the Lake. Both these fields are on the eastern side of the Lake. About 25 miles from the outer bar on the same side of the Lake is the small town of Altagracia, a

loading point from the El Mene field on shore, which is about 29½ miles inland. Situated about five miles inside the Lake from the outer bar stands the old fortress and dungeon of San Carlos, now used as a pilot station, center for the pilots for the outer bar and Tablazo.

Reference to the map shows that the Gulf of Maracaibo (Gulf of Venezuela) is in the form of a bag with the mouth open. From this similarity, and because all that goes into the northern part of the Gulf or mouth of the bag seems to be mercilessly driven by the prevailing wind to the south end of the Gulf or bottom of the bag, this Gulf is colloquially known as the "Saco de Maracaibo."

From the latter part of November to about the middle of July the prevailing wind is from a north-easterly direction and attains a velocity of between 25 and 45 miles per hour. During this period, which is the dry season, short steep seas are set up which make conditions in comparatively small steamers unpleasant and render it necessary for vessels engaged in the trade to be considerably stronger in construction than at first sight appears really necessary.

The waters of the Gulf of Maracaibo are completely within Venezuelan territory, and their whole surface is considered to be territorial without any of the limitations applying to the waters off most shores. Across the Gulf of Maracaibo from the outer bar to the junction of the Gulf with the Caribbean Sea is about 125 miles. What may be called the purely local conditions of the Gulf give place there to a sea with characteristics more normally following conditions as they are created in the great oceans. Vessels therefore may be, and are, expected to show the highest class of construction to be able to ply their trades in these waters.

Close by the junction of the Gulf of Maracaibo with the Caribbean is situated the island of Aruba, on which are located the transfer stations of the Lago Oil and Transport Company (Pan-American interests) and of the Arends Petroleum Company (Mexican Eagle interests). About 70 miles east of Aruba lies the island of Curaçao, to which Venezuelan petroleum transportation was first developed and where the Shell interests have one of the largest transfer stations and refineries in the world. On the eastern shore of the Gulf of Maracaibo, and about 95 miles from the outer bar, is located the transfer station of the Venezuela Gulf Oil Company, subsidiary of the Gulf Oil Corporation of Pennsylvania, which is the only company making its transfers of petroleum to deep water vessels in Venezuelan territory.

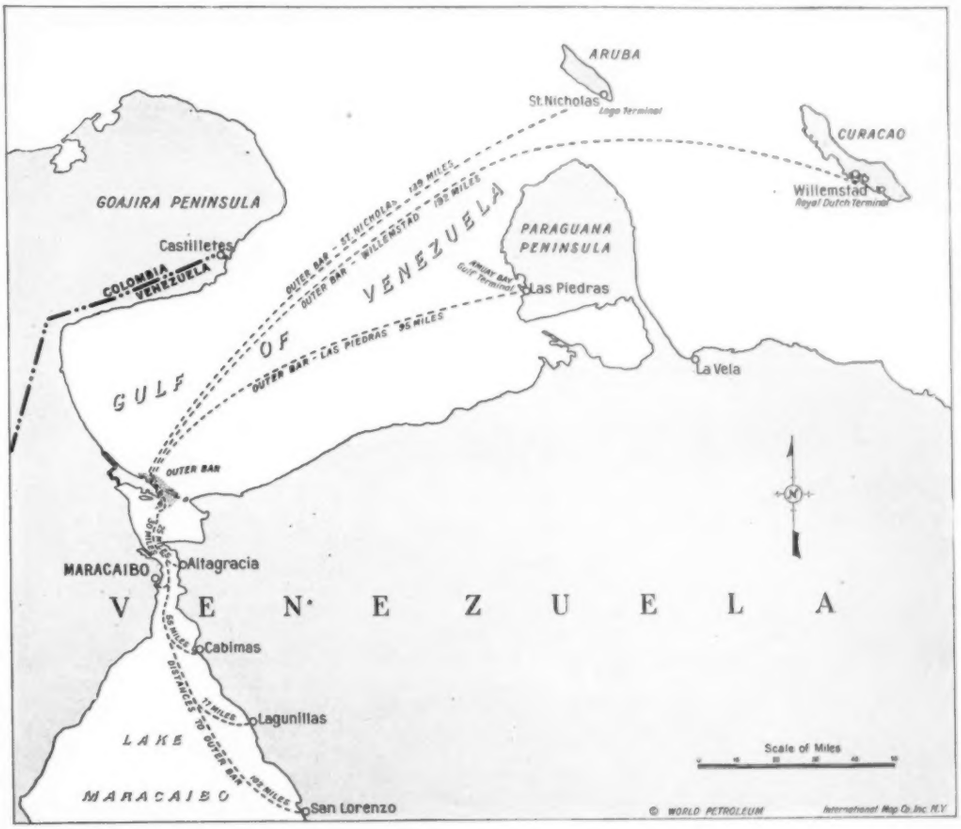
Undoubtedly the world war accelerated the development of all petroleum exploration that had been projected in Venezuela, because that story commences about the early part of the year 1917. Records of happenings at that period are fairly incomplete, or at any rate have not been available to the writer. It appears that petroleum was discovered in what is known as the Mene Grande Field, about 25 miles southeast of the Lagunillas Field. For this petroleum an outlet was found on the eastern shore of the Lake at the nearest point called San Lorenzo, where a small refinery was set up, which still operates.

The fuel oil produced was loaded into wooden barges, built of soft pine in Gulfport, Miss., which were towed by tugs brought from the East Indies to the island of Curaçao, where the fuel oil was distributed on neutral ground for vessels' bunkers. Four of these barges were employed at one time or another, and each carried about 1200 tons. The turn-round of their voyages was very slow, and this made the cost of haulage prohibitive, even though the severe weather conditions they had to meet had not sealed their doom.

Naturally other means had to be found if the Shell interests were to be able to develop their business. One must remember incidentally that even up to the present day petroleum produced in the Lake Maracaibo basin is of no practical value until it has been transported to a deep-water harbor for ocean shipment.

After the world war new tonnage was difficult to obtain for short delivery and was quoted at famine prices. At that time the Shell interests were the only producers of petroleum in the Maracaibo basin, and the Anglo-Saxon Petroleum Company of London controlled their marine transportation. Their attainable activities were limited by the possibilities of securing suitable tonnage within a reasonable time and at an economical price.

A number of monitors, most of which had been engaged in bombardment operations in the eastern Mediterranean, came on the market in England. Eight of them were bought in the early part of 1920 from the British Government and converted into oil tankers at various ship repair yards in the British Isles and in Holland. They were of an average of about 500 tons deadweight each and were named after the first eight Malayan numbers. To operate them in Curaçao a subsidiary company of the Dutch Shell, known as the Curaçaosche Scheepvaart Maatschappij, was created.



Tracks of the tankships in transportation of Venezuelan crude from Lake Maracaibo

One of the converted monitors in 1921 service

This company operates now a much larger fleet which it owns.

These monitors had seldom been required to do any considerable amount of independent steaming on naval service. To adapt them to the purpose of carrying crude oil and to transfer them successfully under their own power, from the repair yards in Europe to Curaçao was a considerable achievement. Seven out of eight of them plied fairly regularly on the trade between Curaçao and the Maracaibo Basin for a period varying from two to four years. This method of transportation was a considerable improvement on that conducted by the tugs and wooden barges, but still kept the cost of haulage at a commercially prohibitive figure.

Up to that time naval architects had not had the opportunity to produce a type of vessel commercially capable of crossing the bars with a sufficiently large cargo and of coping successfully with the weather conditions presented on the sea portion of the route to the points at which the oil required to be transferred in deep water. We have already mentioned that for eight months of the year the northeast trade winds blow almost continuously at high velocities in the Caribbean Sea and the Gulf of Maracaibo. In the deep Caribbean this produces a comparatively long sea which does not subject the ships to abnormal stresses, but in the Gulf of Maracaibo there is created a short, steep sea which requires special consideration in the calculation of the strains to which shallow-draft vessels may be subjected.

In 1920 the bars at the entrance to Lake Maracaibo could not be crossed with a draft of more than 11 ft. Increasing traffic has since assisted the scour of the tidal water to deepen the channel until now it is possible to load vessels to 12 ft. 6 in. Possibly this deepening will persist slowly until ships of the proper kind will be able to load deeper even than they do now.

Curaçao, Aruba, and Las Piedras on the Peninsula of Paraguana, are all to the northeast of the entrance of Lake Maracaibo, as one can see on the map. The loaded portion of the journey is therefore entirely against the force of the wind and sea. Naval architects were given the problem of finding a type of ship which would carry the maximum amount of cargo on a fixed limited draft, which also would be suitable to a speed making the attainable turn-round of the voyage economical and which should be of sufficient comparative strength to be given Lloyd's highest classification.

From the marine transportation point of view, the discovery of such a type has been the deciding factor in the continued expansion of petroleum exports for the Maracaibo Basin. It would not have been possible to expand production in the fields at a greater rate than the combined efforts of naval architects and marine operators were capable of.

This conclusion, however, was not arrived at without exhaustive inquiry into other possibilities. Early it became evident that circumstances would probably limit the number of units which could be successfully handled in and out of Lake Maracaibo over the bars. To that extent production in the fields would be restricted. At that time the Royal Dutch-Shell which were still the only commercial producers and marketers, sent out from Europe a commission composed of experts in their line, to decide whether the future development of petroleum in the Maracaibo Basin would depend on the transportation of the product by a pipeline or on such a number of local tankers as it might be possible to operate. That a report in favor of marine transportation was presented and accepted is apparent. Pipelines to the sea have not been attempted and have not been favorably considered since by the Royal Dutch-Shell or by any other of the powerful operators who have come into the industry in this area since 1923, when, it is believed, that decision was taken.

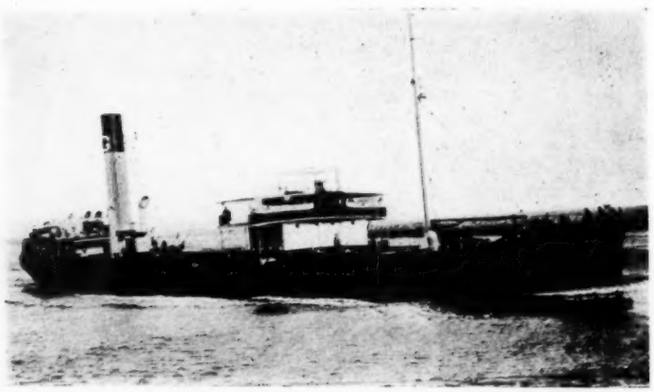
The result of it is seen from the combined figures of the Venezuelan Oil Concessions, Ltd., Caribbean Petroleum Company and British Controlled Oilfields, Ltd. The exports of all three of these companies were, and are still, handled by the Curaçaosche Scheepvaart Maatschappij, but the total was expanded between 1923 and 1924 in the ratio of practically three to eight.

Up to this point the tale is entirely of the development of the Royal Dutch-Shell transportation. In the very beginning of 1923 the great La Rosa gusher indicated to all the world which was interested that here was an area where transportation problems would become real, for the reason that the producing section in the petroleum industry in Venezuela is dependent for the reaping of its rewards on the efficiency of marine transportation methods.

Paraguana, type of the early 14,000 bbl. ship

Those who were gaining experience in solving the transportation problem at once realized that all the conveniences required to make marine transportation safe and economical would require to be created. This would have to be done while revenue was being earned to pay for them, and it would have to be achieved in a limited labor market in which skilled seamen and mechanics were scarce. There was almost an entire absence of navigational marks, and very little local knowledge existed. There were no auxiliary services for ships in the local commercial market, and repair facilities as understood by shipping men, were conspicuous by their absence.

Consequent on production developments during 1923, the year 1924 saw the Lago Petroleum Corporation and the Venezuela



Urdaneta, type of 17,000 bbl. capacity, introduced in 1926

Gulf Oil Company approaching commercial production. The Lago Petroleum Corporation actually exported oil from the Maracaibo Basin in the latter part of 1924. On the understanding that all vessels start level when leaving the outer bar at the entrance of Lake Maracaibo, it had to be taken into consideration early that to deliver their cargoes the only natural site then known where storage deposits could be made for transfer was in the region of Willemstad on the Island of Curaçao.

The Lago Petroleum Corporation explored the possibilities of finding a site which would give a shorter haul, in the hope of an increased turnover per ship per month and therefore a decreased unit cost per barrel. It took up a site, out of which it eventually made a harbor at San Nicholas, towards the southeast point of Aruba Island, incurring a haul from the outer bar of about 139 miles.

Operations were commenced with two small vessels of about 4000 bbl. capacity each in October 1924, and another of about 6500 bbl. capacity was added in November 1924. Profiting by the experience of the pioneers in this transportation, the Lago Corporation almost immediately made preparations for completing four vessels of a capacity similar to those which the Dutch Shell had put into operation in the latter half of 1924. These would transport at the then available draft of 11 ft. 3 in., approximately 15,000 bbl. each.

Of this latter type, by the end of 1924, the Curaçaosche Scheepvaart Maatschappij had put into service seven vessels. All the monitor type of small tankers had been retired to other uses elsewhere. Of the 15,000 bbl. type there were put into service in 1925, seven ships of the Curaçaosche Scheepvaart Maatschappij and the four similar vessels of the Lago Petroleum Corporation already mentioned. The Curaçaosche Scheepvaart Maatschappij added

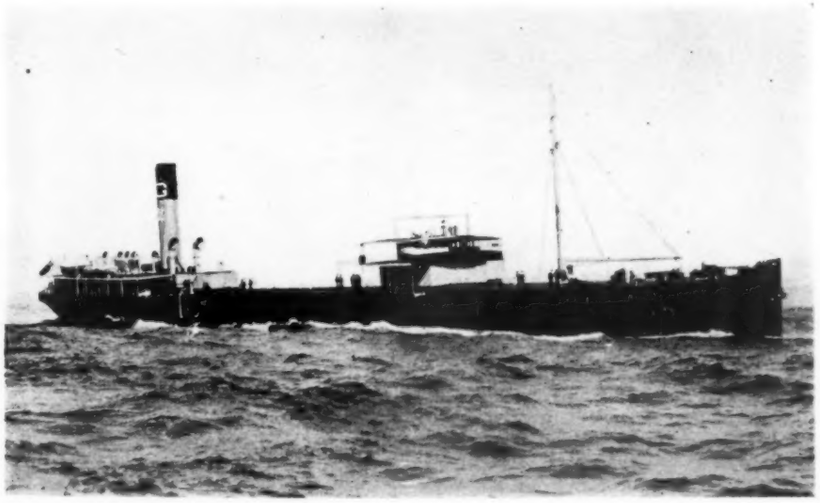
Three tankships alongside loading pier at Cabimas

four more of these vessels in 1926, and the Lago Petroleum Corporation added another two in the same year.

On the Peninsula of Paraguana in Venezuelan territory the Venezuela Gulf Oil Company secured a site which gave about 97 miles less haul than the Royal Dutch-Shell was committed to. This was also 43 miles less than the distance with which the Lago Petroleum Corporation was faced. Though the Gulf Company had commercial production earlier, it did not commence exportation until January 1925.

Then it introduced into the service two vessels which were miniatures of the accepted type of petroleum tankers, except for their proportions. While of a less carrying capacity on the then fixed draft, they were so constructed that they would eventually take advantage of any deeper draft, and consequent larger load, than was then immediately possible. All the subsequent vessels of the Venezuela Gulf Oil Company have been built with the same advantage.

Apure, in service May 1928, latest type, 21,300 bbl. capacity ship



The Curaçaosche Scheepvaart Maatschappij and the Lago Petroleum Corporation continued until the end of 1928 to build all their vessels of practically uniform dimensions, but the Venezuela Gulf Oil Company have progressively improved the type of their ships and increased their size from a rated capacity of 13,000 bbl. to a rated capacity of 20,000 bbl.

In the text of this article appear four tables. Table 4 shows a summary of exports from the Maracaibo Basin by individual companies for the full years for which there are any records and for nine months of the year 1929. Tables 1, 2, and 3 give particulars of the fleets belonging to the various companies contributing towards this movement. The Creole Petroleum Corporation referred to in Table 3 is a subsidiary of the Standard Oil Company of New Jersey, whose ships are managed by the Venezuela Gulf Oil Company, and for this reason the particulars of those ships are placed in the same table.

From the very large number of ships engaged it will be evident that many of them are turned round each day. In fact a total average of about 24 tankers enter the Lake each day, and about the same number also leave for their various destinations. Owing to the very small range of tide (not more than 2 ft.) between low and high water, it is necessary, in order to load the ships to the maximum depth, to arrange that they pass both the bars at the entrance to the Lake as near as possible to high water.

It is in fact a matter of mutual convenience for the whole loaded fleet to be able to pass over either one of the bars in not more than one hour. The method employed to expedite their movement is to form a parade, known to naval men as "single line ahead formation," with the tankers about

600 yards apart. No vessel has the right to pass the vessel ahead, and the duty of moving at the greatest speed consistent with safety devolves on those ships leading the separate groups forming the line. Between the companies operating the vessels there is complete cooperation, and the mutual arrangements have resulted in the traffic being conducted with a very high percentage of immunity from the accidents which might be expected to happen from such a volume of transportation in such tortuous and shallow waters.

This has been accomplished by the constitution of a Marine Conference composed of the marine representatives of the companies interested. It meets every two months for the consideration of traffic problems and for the purpose of introducing or influencing regulations which may be necessary or projected for the control of the traffic. Night navigation of the bar channels has hitherto been impossible owing to the absence of any lighting system by which vessels might be guided. This, of course, has made it imperative that all loaded traffic should cross the bars during daylight high water and has detracted from the maximum efficiency which could have been secured from the number of vessels employed if both day and night tides could have been worked.

The Government has now commenced to install a lighting system which was recommended by the Marine Conference. The passage of traffic over the bars will be considerably facilitated, and eventually, if necessary, a much larger number of ships can be put into the trade with proportionate expansion of production in the fields. That it will be possible to navigate the outer bar channel in all conditions of weather even after the lighting system is installed is not yet certain. Probably it will be a matter of experience to ascertain what percentage of increased exportation can be safely realized by accelerating the turn-round of vessels for the night tide.

Practically no source of supply of competent officers and engineers for vessels exists either in Venezuela or in the islands to which these vessels trade. Because the ships have been built in Europe, the captains, officers and engineers of the vessels are nearly all European. The deck and engine room crews are composed principally of men from the Dutch Islands or from the Island of Margarita off the coast of Venezuela who have previously been "sail-trained" in schooners, but who have generally shown a marked aptitude for a training in the duties required on board steam vessels. The domestic staffs are usually Chinese.

Table 1
Vessels running to Curacao
CURACAOSCHE SCHEEPVAART MAATSCHAPPIJ
Capacities in U. S. barrels of 42 U. S. gal. at 60 deg. Fahr.

Vessel	Service	Capacity
President Gomez	June, 1922	Now mainly for
President Bolivar	Oct., 1922	refined products
Mariquita	July, 1923	14,000
Juanita	July, 1923	14,000
Julieta	May, 1924	16,000
Martina	June, 1924	16,000
Marsella	July, 1924	16,000
Conchita	July, 1924	15,700
Carlota	Oct., 1924	15,000
Manuela	Oct., 1924	16,500
Justina	Nov., 1924	16,500
Casandra	Feb., 1925	16,000
Chepita	Mar., 1925	15,800
Mariana	May, 1925	16,000
Maruja	Sept., 1925	16,000
Martica	Nov., 1925	16,000
Felipa	Dec., 1925	16,000
Maximina	Feb., 1926	16,000
Frasca	Nov., 1926	16,000
Matilde	Nov., 1926	16,000
Lucita	Dec., 1926	16,000
Berta	Aug., 1927	15,600
Liseta	Aug., 1927	15,600
Brigida	Oct., 1927	15,000
Petronella	Nov., 1927	14,000
Paula	Dec., 1927	13,000
Alicia	Mar., 1928	16,000
Leticia	Mar., 1928	16,000
Adela	July, 1928	17,000
Lucrecia	Oct., 1928	16,000
Elena	Dec., 1928	17,000
Juliana	Dec., 1928	17,000
Josefina	Jan., 1929	17,000
Leonor	Apr., 1929	17,000
Paquita	Feb., 1929	17,000

Table 2
Vessels running to Aruba
LAGO PETROLEUM CORPORATION
Capacities in U. S. barrels of 42 U. S. gal. at 60 deg. Fahr.

Vessel	Service	Capacity
Francunion	Oct., 1924	4,000
Invercorrie	Nov., 1924	6,500
Inverlago	Apr., 1925	15,000
Inverrosa	June, 1925	15,000
Invercaibo	July, 1925	15,000
Inverruba	Sept., 1925	15,000
San Nicolas	June, 1926	15,000
Ambrosio	Sept., 1926	15,000
Icotea	July, 1927	15,000
Lagunilla	July, 1927	15,000
La Salina	July, 1927	15,000
San Carlos	Aug., 1927	15,000
Oranjestad	Oct., 1927	15,000
Sabaneta	Oct., 1927	15,000
Punta Benitez	Apr., 1928	16,000
Tia Juana	Apr., 1928	16,000
Hooiberg	May, 1928	16,000
Punta Gorda	June, 1928	16,000
Yamanota	July, 1928	16,000
Surinam	June, 1929	21,000
Tamare	May, 1929	21,000
Ulé	June, 1929	21,000

ARENDS PETROLEUM MAATSCHAPPIJ
(MEXICAN EAGLE)

San Camilo	Jan., 1928	15—15,500
San Castro	Mar., 1928	15—15,500
San Claudio	Mar., 1928	15—15,500

Table 3
Vessels running to Las Piedras
VENEZUELA GULF OIL COMPANY
Capacities in U. S. barrels of 42 U. S. gal. at 60 deg. Fahr.

Vessel	Service	Capacity
Cabimas	Jan., 1925	14,000
Paraguana	Feb., 1925	14,000
Zapara	May, 1926	14,000
Toas	June, 1926	14,000
Sucre	July, 1926	17,000
Bolivar	Aug., 1927	17,000
Urdaneta	Sept., 1927	17,000
Monagas	Sept., 1927	17,000
Paez	Oct., 1927	17,000
Aragua	Oct., 1927	17,000
Perija	Nov., 1927	17,000
Acosta	Apr., 1928	17,000
Catatumbo	May, 1928	21,300
Apure	May, 1928	21,300
Caroni	June, 1928	21,300

CREOLE PETROLEUM CORPORATION

Creole Bueno	Dec., 1928	21,300
Creole Jefe	Oct., 1928	21,300
Creole Lindo	Nov., 1928	21,300

Table 4
Maracaibo Basin Transportation for Separate Years
Quantities in U. S barrels of 42 U. S. gal. at 60 deg. Fahr.

	Lago	Gulf	V.O.C.	B.C.O.	Caribbean	Eagle	Creole	Basin Total
1917	.....	.....	.....	.....	57,096	.....	.....	57,096
1918	.....	.....	.....	.....	143,880	.....	.....	143,880
1919	.....	.....	.....	.....	14,309	.....	.....	14,309
1920	.....	.....	.....	.....	.....	.....	.....	.....
1921	.....	.....	.....	.....	997,643	.....	.....	997,643
1922	.....	.....	.....	.....	1,813,452	.....	.....	1,813,452
1923	.....	.....	352,000	19,639	2,972,789	.....	.....	3,344,428
1924	377,258	.....	2,533,971	1,066,837	4,575,484	.....	.....	8,553,550
1925	4,102,116	1,773,437	4,465,091	2,629,738	5,916,035	.....	.....	18,886,417
1926	5,627,798	6,178,106	11,302,291	2,197,689	8,186,883	.....	.....	33,492,767
1927	14,173,124	11,561,161	19,736,648	2,471,848	9,118,275	.....	.....	57,061,056
1928	28,157,427	24,500,648	29,476,208	1,826,051	12,398,399	3,935,400	.....	100,294,133
1929 (9 mo.)	23,842,516	22,139,909	28,777,299	1,475,799	10,099,732	4,760,862	5,426,374	96,522,491
	76,280,239	66,153,261	96,643,508	11,687,601	56,293,977	8,696,262	5,426,374	321,181,222

Oil carried by the Eagle fleet should be credited to the V.O.C., because the latter company produced it.
Oil carried by the Creole fleet should be credited to the "Gulf" Company, because the latter company produced it.